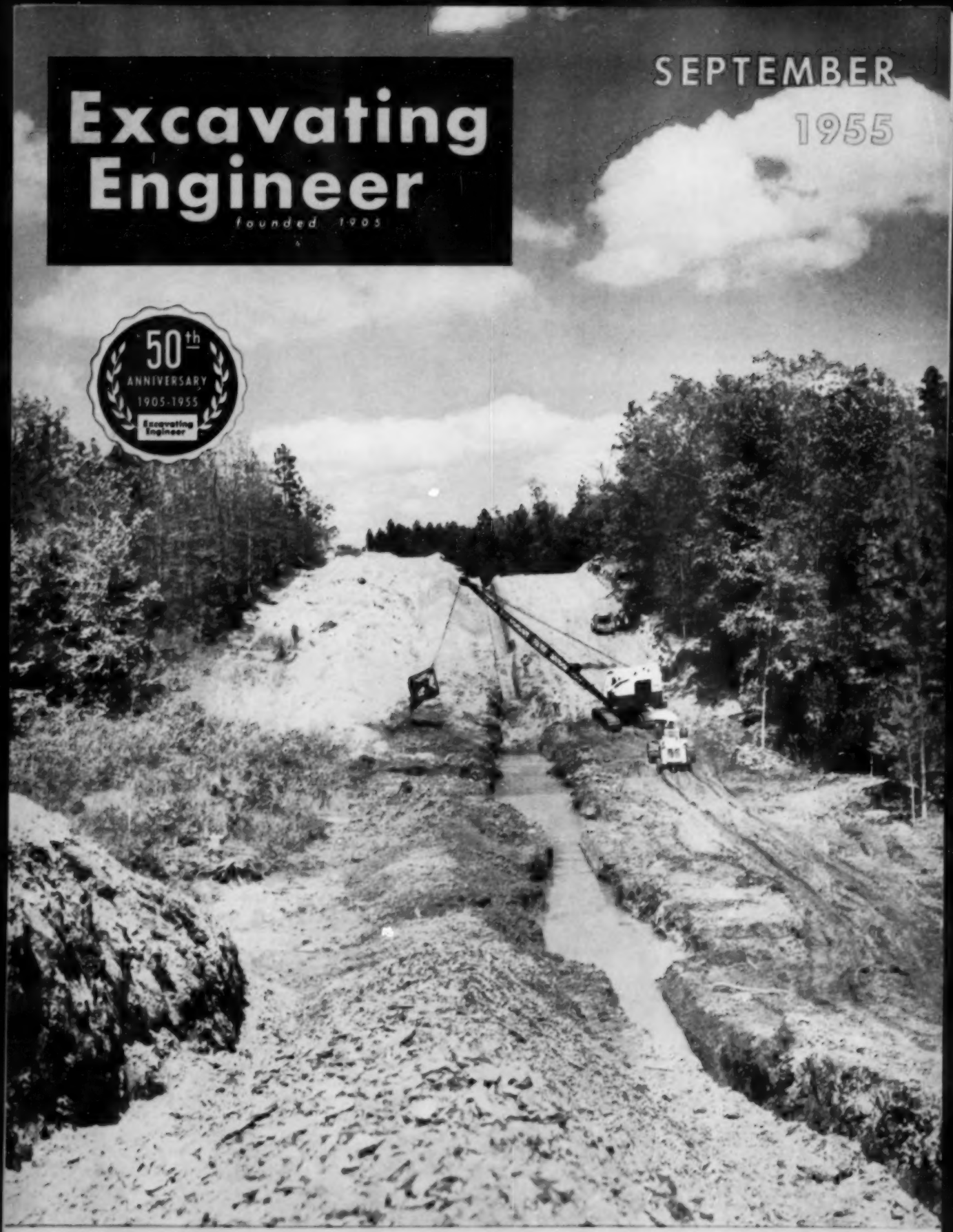
Excavating Engineer

founded 1905

SEPTEMBER
1955

50th ANNIVERSARY
1905-1955
Excavating Engineer



Torrential spring rains caused concern along almost the full length of Texas to New York pipeline expansion project. Here, on one of eight main line looping contracts, a clamshell digs out a water filled ditch in Alabama. Illustrated article begins on page 25.

Torrential spring rains caused concern along almost the full len
one of eight main line looping contracts, a clamshell digs out a w

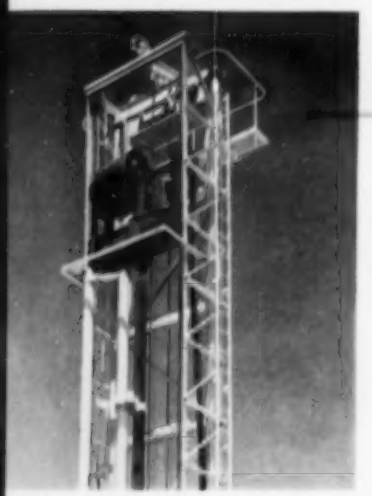
40-R and 50-R

BUCYRUS ERIE

Rotary Blast Hole Drills

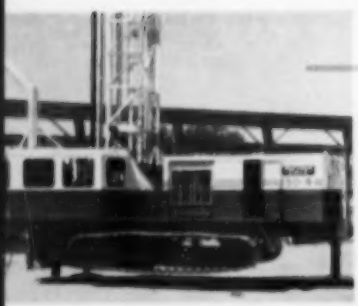
PROVIDE ALL-ROUND SPEED ON LARGE-SCALE PROJECTS

Mines, quarries, and big construction jobs profit from the high-speed, large-diameter hole making ability of Bucyrus-Erie rotary blast hole drills. In shallow or deep holes, you get speed every minute.



Speedy Tool Handling

To make up a tool joint, a remote-controlled tool storage rack swings your selection of drill pipe into place above the hole and centers it under the rotary drive machinery. The rotary machinery is lowered to meet the drill pipe; then rotary coupling and pin joint on the drill pipe are screwed together under power. Make-up is counted in seconds. Dismantling is equally fast.



Move-Up Speed

Travel over rough ground and through mud is fast because of the tractor-like mobility of the crawler mounting. Excellent stability permits most moves to be made with the derrick up. Set-ups are simply a matter of leveling the machine again. Hydraulic jacks quickly correct machine tilt.

There are two Bucyrus-Erie rotary drill models. The 40-R drills 6¼ to 9-in. holes and offers a choice of diesel-electric or full electric power. Model 50-R drills 9⅞ to 12¼-in. holes and is electrically powered. For detailed, illustrated bulletins, write today to —

Drilling Speed

The entire length of each drill pipe section can be drilled down in one non-stop run. Both rotary drive and pulldown force are applied at the top of the drill pipe and follow it all the way down. That means fast hole on your job. Hole progress is continuous, too, because rotation speed can be changed instantly as needed through Ward Leonard electric control, and down pressure can be varied through hydraulic control. Instant speed and pressure adaptation mean faster hole on your job. All controls — electric, hydraulic, and air — are conveniently grouped on one central panel.

30B55C

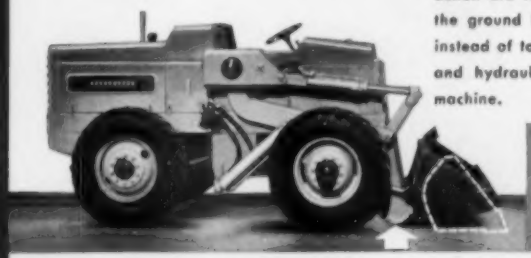
BUCYRUS-ERIE COMPANY South Milwaukee Wisconsin

length of Texas to New York pipeline expansion project. Here, on water filled ditch in Alabama. Illustrated article begins on page 25.

Three completely New PAYLOADER® tractor-shovels with new "more-yardage" features

POWERFUL PRY-OUT ACTION

Tremendous pry-out force is obtained by using the breakout pads on the ground as a fulcrum for leverage. The load forces opposing the pry-out action are thus transferred to the ground through the pads instead of to the axle, wheels and hydraulic system of the machine.



model HU 1 cu. yd.

40° BREAK-OUT at ground level

You can get HEAPED BUCKET LOADS and you get them FASTER and EASIER WITH THIS NEW BUCKET ACTION. Most important of all — you KEEP BIGGER PAYLOADS—because the bucket can be tipped back a full 40 degrees at ground level before it is raised, eliminating spillage.

model HH 1½ cu. yd.

SAFETY and STABILITY

Special boom-arm shape and positioning keeps moving members out of operator's reach at all positions. Close, low, load-carry position and longer wheelbase provide stability and balance for fast maneuvering — with safety.

model HO 2 cu. yd.

These three all-wheel-drive "PAYLOADER" units are outstanding examples of Hough's continuing pioneering and leadership in tractor-shovel design. They have more digging power, get big bucket loads easier, can carry them faster and safer.

They are full of other features and improvements that boost output, operator comfort and safety and that lower the cost of digging, scooping-up, loading, moving and piling earth and bulk-materials.

Your "PAYLOADER" Distributor is ready to demonstrate these new units and what they can do — for you.

HOUGH-DESIGN HOUGH-QUALITY

More Horsepower per bucket capacity than any other standard models. Either diesel or gasoline engines available.

Easy to Operate Fullest operator visibility for safe, fast maneuvering; power steering; powerful hydraulic brakes; adjustable seat with molded foam-rubber cushions.

Powerful Transmissions Powershift transmission is standard equipment on the big model HO; four-speed full-reversing types on model HH and HU. Torque converter drives are standard equipment on all models — multiply engine torque up to 350% — act as shock absorbers for the entire power train.

THE FRANK G. HOUGH CO.
708 Sunnyside Ave. Libertyville, Illinois

Send full information on new "PAYLOADER" Tractor-Shovels

- ☐ Model HU 1 cu. yd.
- ☐ Model HH 1½ cu. yd.
- ☐ Model HO 2 cu. yd.

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Title .....
Company .....
Street .....
City .....
State .....

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BUCYRUS-ERIE COMPANY Wisconsin

MIANUS RIVER DAM and Reservoir, Greenwich, Fairfield Co., Conn., for Greenwich Water Co. Merritt, Chapman & Scott Corp., *Contractors;* American Water Works Service Co. Inc., Phila., Pa., *Consulting Engineers;* DeLeo Bros., Inc., Stamford, Conn., *Excavation Sub-contractors.*

On Mianus River Dam, Greenwich, Conn.

IT'S MACKS 100%

This project, which is being built to insure an adequate water supply for Greenwich, Conn., Port Chester and Rye, N. Y., involves moving 375,000 cubic yards of earth and rock fill.

The dam itself will be 1,200 ft. long, 77 ft. high, 430 ft. across at the base and 20 ft. across at the top. As Mr. Sam DeLeo of DeLeo Bros., Stamford, Conn. excavation contractors, puts it, "We've got a real earth-moving job here, all right.

"To do the best job, and to be sure we fulfill our contract on schedule, we're relying on Macks.

"Ours is a Mack fleet, exclusively. Moreover, the additional trucks we've hired to increase our hauling capacity on this job are Macks. In fact, with us, it's Macks all the way."

DeLeo Bros., like so many heavy construction contractors, have used Macks for years. They know that Macks keep cycle time down over the toughest terrain. Fast, uninterrupted schedules are assured, thanks to Mack's Balanced Bogie and exclusive Power Divider . . . the combination that provides maximum flexibility, even tire loading, uniform braking and positive traction in soft or slippery going.

In addition, the fact that Mack makes more of its own components than any other manufacturer means that Macks are built better from the axle up. They're stronger, require less maintenance, assure longer service life. As Mr. DeLeo says: "It pays to invest in Macks."

MACK TRUCKS Empire State Building, New York 1, N. Y. 3130

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Excavating Engineer

founded 1905

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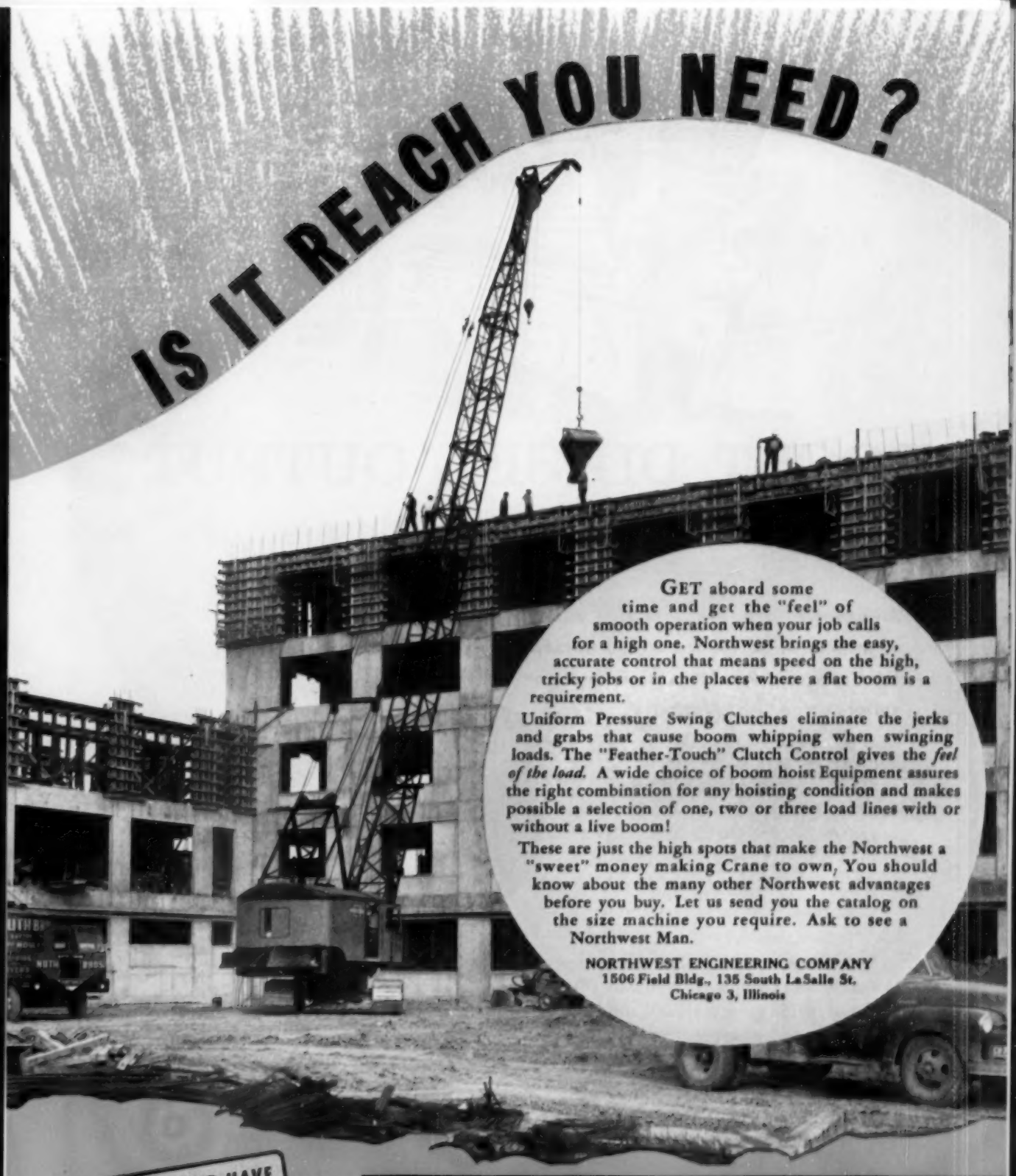

GET aboard some time and get the "feel" of smooth operation when your job calls for a high one. Northwest brings the easy, accurate control that means speed on the high, tricky jobs or in the places where a flat boom is a requirement.

Uniform Pressure Swing Clutches eliminate the jerks and grabs that cause boom whipping when swinging loads. The "Feather-Touch" Clutch Control gives the *feel of the load.* A wide choice of boom hoist Equipment assures the right combination for any hoisting condition and makes possible a selection of one, two or three load lines with or without a live boom!

These are just the high spots that make the Northwest a "sweet" money making Crane to own, You should know about the many other Northwest advantages before you buy. Let us send you the catalog on the size machine you require. Ask to see a Northwest Man.

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Chicago 3, Illinois

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UNLESS YOU OWN A NORTHWEST

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AiResearch Turbochargers give your stationary or mobile diesels more added horsepower than any comparable turbocharger or supercharger installation!

The application of AiResearch Turbochargers to stationary diesel equipment will overcome excessive noise and smoke problems... jump horsepower to a much higher level... and cut your fuel bills on a horsepower per hour basis.

In addition, it will restore operating efficiency for your diesel power plants at altitude.

Application of these finely engineered power packages to mobile diesel equipment is equally effective... as has already been demonstrated in the remarkable results achieved by the installation of AiResearch Turbochargers on Caterpillar diesel machinery.

AiResearch is the largest producer of small turbomachinery in the United States, with twenty-five *million* hours of experience. This unmatched experience explains why AiResearch Turbochargers lead in power, economy and dependability. Your inquiries are invited.

THE GARRETT CORPORATION

AiResearch Industrial Division

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DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND RELATED MACHINERY

For all construction equipment

Whether you need wire rope for scrapers, draglines, shovels, or any other purpose—there is a MONARCH WHYTE STRAND rope that's *right* for your needs. WHYTE STRAND wire ropes are designed for the proper combination of flexibility, strength, and resistance to abrasion... the qualities you need to get better service at lower cost.

Macwhyte makes a thousand and one types, sizes, and grades of wire rope. These are supplied internally lubricated and PREformed, in Lang Lay or Regular Lay, with Independent Wire Rope Core or Fiber Core for all equipment.

Put WHYTE STRAND on your equipment and see how it can save you time and money. Ask for recommendation booklet No. 53-25.

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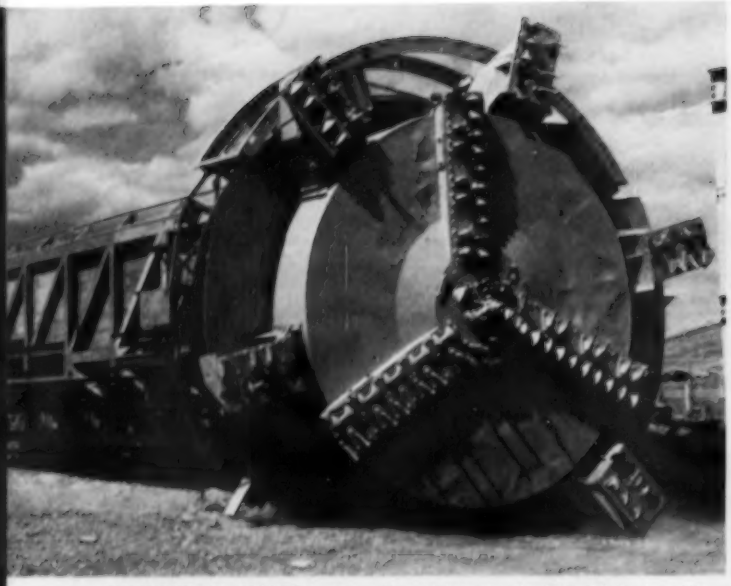
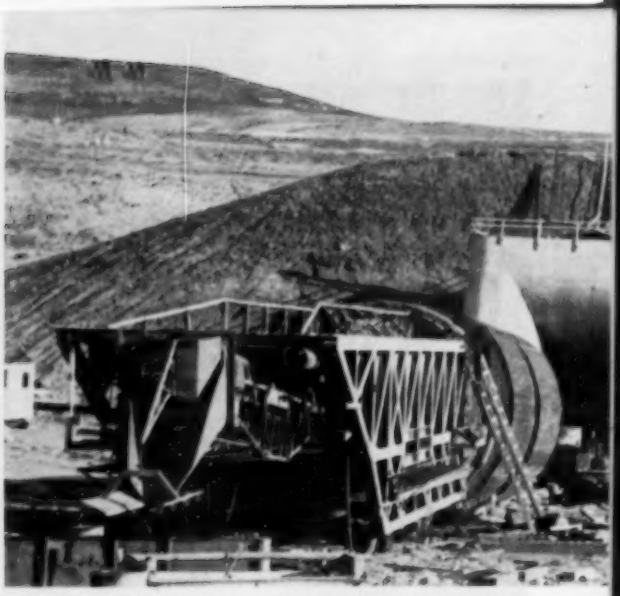
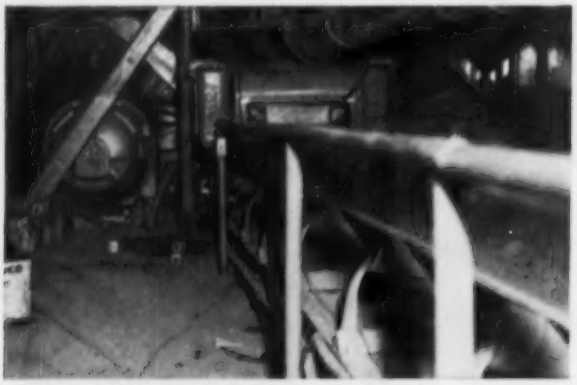
Send for Contractor's Equipment Booklet 53-25!



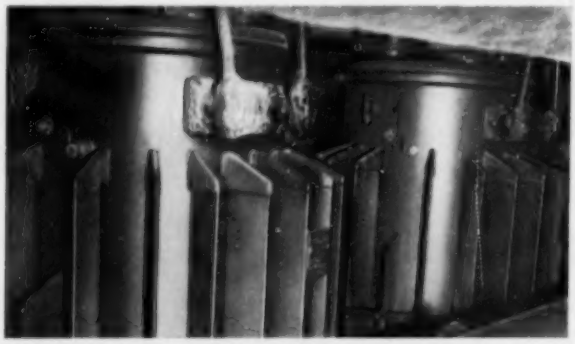
MECHANICAL MARVEL shows its mighty teeth. The 26-foot cutting face can be raised, lowered, and swung from side to side to alter direction of cut. Note concentric cutter heads and shale scoops.



IMMENSITY OF JOB is suggested by view of six tunnel entrances bored in record time by new mole (above). Reinforced concrete tunnels average 1830 feet long.

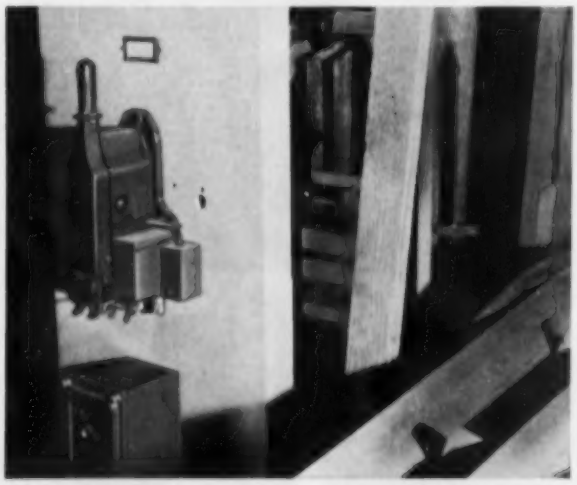


DIGGER'S RELIABILITY depends largely on performance of two 200-hp G-E wound-rotor motors driving cutters through gear mechanisms. Conveyor carries rubble to cars at rear of mole.

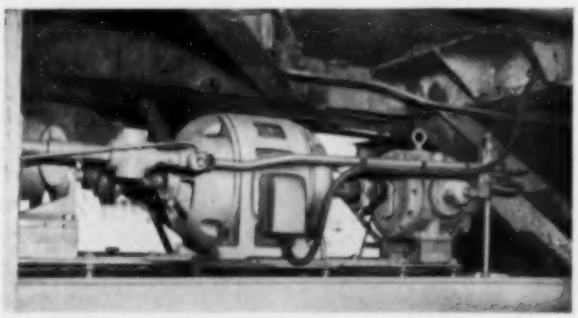


THREE COMPACT 167-kva G-E transformers in digger step down power supplied by cable from diesel-generator outside.

G-E MOTOR CONTROLLERS provide short circuit protection and permit centralized push-button control at operator's station.



PROTECTION of electrical system is provided by dead-front panel with circuit breaker and ground relay. Compact General Electric equipment had to fit into tight space available.



EXACT FORWARD MOVEMENT into rock face is accomplished with highly dependable G-E 25-hp motor furnishing power for hydraulically operated "feet" which propel mole on tracks.

GENERAL ELECTRIC

Electrically powered by General Electric . . .

New giant "mole" chews tunnels 26′ wide over 4 times faster than previous methods

Mittry Constructors' tunnel digger illustrates high productivity possible with electrified tools

At the Oahe Dam of the Missouri River development near Pierre, S. D., an electrified tunnel digger 90 feet long has slashed tunneling time, costs and dangers. This imaginative use of electricity is even more successful than anticipated by its pioneering designers. James S. Robbins and Associates, Chicago, designed and built the "mole" for Mittry Constructors of Los Angeles under license from Goodman Mfg. Co., Chicago. According to Robbins, help from J. R. Porter, G-E engineer, greatly contributed to completing the digger two months ahead of schedule.

Problem was extremely difficult: How to dig six tunnels each over one-third mile long without exposing shale more than 30 days? Longer exposure would dry and dangerously weaken shale.

Solution was new electrified tool, which dramatically cut tunneling time to less than one fourth that needed by other methods. Digger was designed with two motor-driven concentric revolving cutter heads with large shale scoops on outside ring. Sections revolve in opposite directions to equalize cutting torque. Scoops dump shale through hopper to conveyor belt. Every four feet, a large I-beam is rammed into shale walls for support. Concrete is then pumped into forms to finish walls.

Down time has been practically zero. Despite conditions such as a constant humidity of 95% in the tunnels, G-E equipment has reliably powered this giant mole continuously and efficiently.

Electrified construction tools can pay off the same way for you too. Let your G-E Apparatus Sales representative show you how G-E equipment, backed by G-E engineering service, can raise tool productivity. Contact your nearest G-E Apparatus Sales office, or write General Electric, Sect. 664-37, Schenectady 5, N.Y.

Engineered Electrical Systems for Heavy Construction Tools

GENERAL ELECTRIC

STANDING BY MOLE'S "FACE" are Bill Mittry of Mittry Constructors and Jim Dillman of G.E., who helped plan the new tunnel giant.

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but behind every

CARSET JACKBIT

there's a complete line of rock drilling equipment

WHATEVER you need for drilling rock, this complete line is a big plus in your favor. It means one source with undivided responsibility. It means a co-ordinated line of equipment that's designed and built to work together. And it means complete *service*, too — backed by over 80 years of experience and leadership in this specialized field.

You'll find that it *pays* to make Ingersoll-Rand your headquarters for everything in rock drilling.

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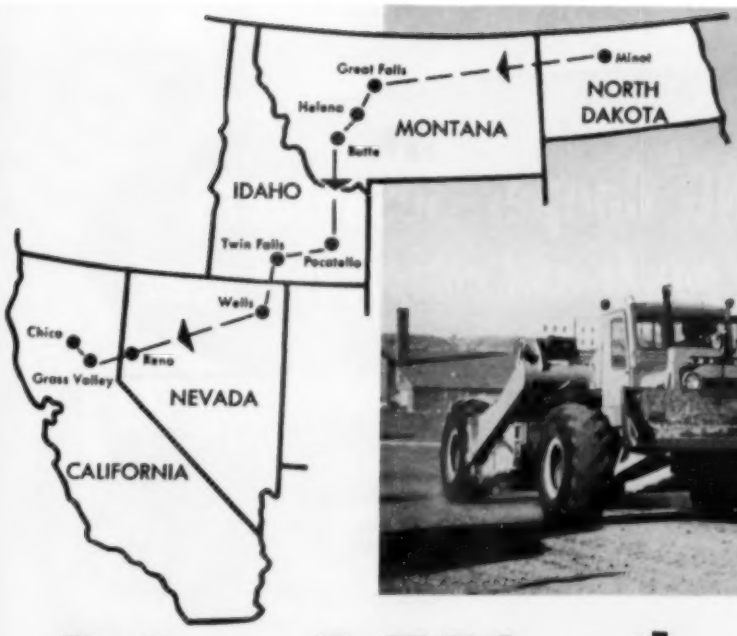


Drives 1,750 miles . . . total cost $170 total saving $800

What would you do if your dirtmoving equipment was in North Dakota and you had the chance to work in California?

If you had crawlers and scrapers, or big self-propelled scrapers, you'd probably ship them by rail. It would cost you at least $870 per unit one-way, and the trip would take a week or 10 days. Expensive? Yes, but about the only method you could use.

Vernon Testerman, Minot (North Dakota) contractor, had another solution to the problem. His 7-yard D Tournapull, he figured, could easily make the trip under its own power. After all, he had driven the "D" all over North Dakota. The unit's low-pressure tires did no damage to pavement. It was narrow enough and light enough to go anywhere. And it could travel most of the way at 28 mph.

Remembering these advantages, Contractor Testerman checked his machine, loaded fuel drums and other supplies in the scraper bowl, filled up the tank and started off.

Travels 80 hours, averages 22 mph

First check-point for contractor and machine was Great Falls, Montana. From here, the "D" traveled to Helena and Butte, Montana . . . then through Pocatello and Twin Falls, Idaho . . . Wells and Reno, Nevada . . . and Grass Valley, Calif.

On the 8th day, Tournapull arrived in Chico, California. It had traveled 1,750 miles. Total running time, as clocked by the hour-meter, was 80 hours.

"Cost of the trip," writes Testerman, "was exactly $170. That includes fuel, oil, meals, hotel, even cigarettes for the driver, Garry Dibble of Stanley, N.D. It also includes the price of a new water pump. I also had to buy a license in Montana, which cost $11; otherwise I wasn't stopped or asked any questions except by curious people who said I was crazy. They will really think so when I meet them on the road back home to North Dakota."

Or maybe they won't think so, when they realize Testerman saved $700 on the one-way freight bill alone. Or that he also saved about $100 for air or rail transportation for his operator. Plus 1 or 2 days in time. Plus a lot of trouble loading, unloading, etc.

Finishes jobs before others arrive

Chances are, you may never have to make a thousand or two-thousand mile trip with your dirtmoving equipment. However, Tournapull's work-and-run ability cuts non-productive time to a minimum on *any* length *move*. With Tournapulls, you take the shortest route between jobs, over main highways and through cities, to make the most economical use of manpower and equipment. As Mr. Testerman puts it, "With D Tournapull, you can travel to a small job and have it finished before another type of machine could be loaded and moved. The money you once paid for hauling can be put in your pocket."

Ask us for a demonstration of the LeTourneau-Westinghouse D Tournapull so you can check its mobility and other advantages for yourself. Call to arrange time and place.

Tournapull—Trademark Reg. U.S. Pat. Off. DP-647-G-b

LeTourneau-Westinghouse Company

PEORIA ILLINOIS

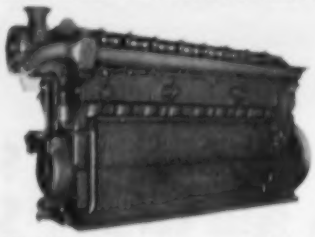
A Subsidiary of Westinghouse Air Brake Company

On the job, "D" Tournapull usually self-loads. Here it heaps 5 pay yds. of sandy loam in 1 min. Typical 900' cycles take 2⅗ minutes.

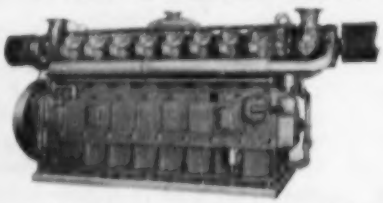
Tires provide such good compaction, rollers often are not needed. Nor are small tractor-dozers; "D's" blade does much of their work.

TOP PERFORMING Cooper-Bessemers
for every heavy-duty power and compressor need

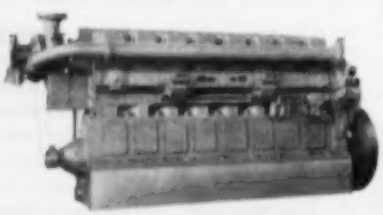
TYPE LSV . . . . . 12 or 16 cyl.
Atmospheric and Supercharged
Gas . . . . . 1440 to 5000 hp.
Diesel and Gas-Diesel . . 1650 to 5000 hp.



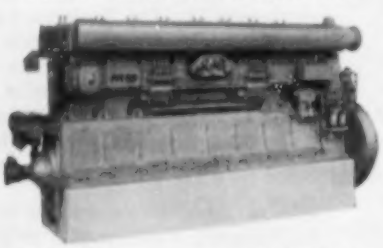
TYPE LS . . . . . 6, 7, 8 cyl.
Atmospheric and Supercharged
Gas . . . . . 660 to 2500 hp.
Diesel and Gas-Diesel . . 965 to 2500 hp.



TYPE FVA . . . . . 6, 8, 12 or 16 cyl.
Diesel — Atmospheric . . . . . 310 to 835 hp.
Diesel — Supercharged . . . 560 to 2200 hp.



TYPE JS . . . . . 5, 6, 7 or 8 cyl.
Atmospheric and Supercharged
Gas . . . . . 325 to 1815 hp.
Diesel and Gas-Diesel . . . . 430 to 1815 hp.



TYPE GS . . . . . 5, 6 or 8 cyl.
Atmospheric and Supercharged
Gas . . . . . 320 to 1460 hp.
Diesel and Gas Diesel . . . . 300 to 1460 hp.

• Available in a range of sizes from 100 to 5000 hp., Cooper-Bessemer engines and compressors are ready to meet *your exact requirements.*

The standard units shown here are typical of the many "top performers" now offered by Cooper-Bessemer. With "Tri Fuel" operation of most 4-cycle engines, and a new line of centrifugal compressors, Cooper-Bessemer continues to put into practice its policy of "Another Example of Efficient Power at Lower Cost".

Here, to list but a few, are plus values that make *every* Cooper-Bessemer a natural choice when it comes to purchasing new engines or compressors . . . low-cost operation, unmatched efficiency, extreme compactness, long-life dependability, easy accessibility, minimum maintenance and more than a century of engine building experience.

New bulletins offer the latest information. Get your copy by writing: The Cooper-Bessemer Corporation, Mt. Vernon, O.

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COOPER-BESSEMER
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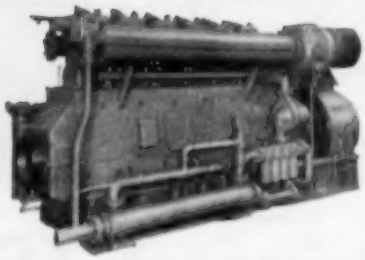
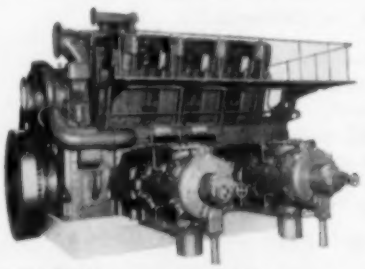
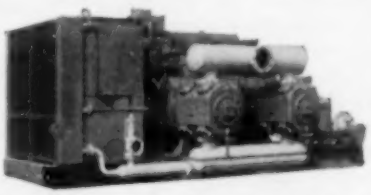


TYPE FWA . . . . . 6 cyl.
Diesel — Atmospheric . . . 245 to 500 hp.
Diesel — Supercharged . 420 to 835 hp.

TYPE GMWA . . . . . 6, 8 or 10 cyl.
Gas Engine Driven Compressors
. . . . . 1500 to 2500 hp.



TYPE GMVA . . . . . 4, 6, 8, 10 cyl.
Gas Engine Driven Compressors
. . . . . 540 to 1350 hp.



TYPE GMXD . . . . . 4, 6, 8 or 10 cyl.
Packaged Unit
Gas Engine Driven Compressor . 265 to 660 hp.

M-LINE RECIPROCATING COMPRESSORS
100 to 5000 hp. 9"-14" stroke
Speed to 514 RPM

Says Tournatractor's operator, "My machine operates easier than a crawler. It does about twice the work, yet does not make me feel tired at the end of a shift."

2 crawlers replaced by 1 Tournatractor

Rubber-tired unit stockpiles coal, handles quarry cleanup, plows snow

When a leading Canadian cement manufacturer tried their rubber-tired Tournatractor at their Ontario plant, they found it could handle 10 to 15% more work than the *two* 148 hp crawlers it replaced. Jobs taken over by 186 hp Tournatractor include building and maintaining roads, removing snow, and cleaning up around shovel at quarry pit.

Another regular task is stockpiling of coal for the plant, as it is unloaded directly from boats to lakeshore. Spreading coal with Tournatractor saves the manufacturer considerable capital investment since it eliminates need for installation of cranes and other fixed structures. Rubber-tired tractor makes 1-mile trip from plant to quarry at least twice per 8-hour shift, traveling job-to-job at speeds to 19 mph.

1800' dozing cycle in 3 minutes

On a typical 900-ft. stockpile dozing run, which includes dozing up adverse grades, Tournatractor completes forward and return cycle in only 3 minutes. Loads of coal averaging 3 yards are pushed in second gear (3.7 mph); return is made in high reverse (8 mph).

Coal is compacted in the normal work cycle. Big low-pressure rubber tires eliminate air pockets that cause danger of spontaneous combustion. Nearly 2 feet wide, they compact smoothly without digging ruts or grinding coal into fines.

95% efficiency on production

4-wheel anti-friction drive eliminates about 550 wearing parts of crawler track assemblies . . . greatly reduces machine maintenance. After 1330 hours on its busy schedule, Tournatractor records showed 95% mechanical efficiency. "We have found Tournatractor satisfactory both from an operating and maintenance point of view," says the plant manager.

Adds the foreman, "Our Tournatractor has proved satisfactory on every job we have placed it on, including stockpiling coal, shovel cleanup, snow plowing, and maintenance and construction."

If you are looking for increased production and lower maintenance, it will pay you to investigate Tournatractor now *before you replace another set of tracks.* Your LeTourneau-Westinghouse Distributor will gladly arrange a demonstration of Tournatractor on *your* job.

Tournatractor "doubles" as cleanup tool at limestone pit. Rig makes 1-mile trip between stockpile and pit in about 4 minutes. Tournatractor beats crawlers because it has the speed (19 mph forward and 8 mph reverse) and the power (pictured, 186 hp; newest models, 208 hp) to work faster.

Tournatractor—Trademark D-324-CH-b

LeTourneau-Westinghouse Company

PEORIA ILLINOIS

A Subsidiary of Westinghouse Air Brake Co.

TWIN-POWER "EUCS" ON

Power to move the earth! A Euclid TS-18 Scraper with two engines and total of 494 h.p. is push loaded by a TC-12 "Euc" tractor powered by two 194 h.p. engines—a total of 882 h.p. at work. Because of the difficult sandy conditions, Western's scrapers are equipped with extra power for the tractor drive axle—300 h.p. rather than 194 h.p.

Euclid Twin-Power Provides Unequalled

WORKABILITY

Twin-Power—the use of two engines driving separate axles—was pioneered in the earth moving field by Euclid nearly 10 years ago. It provides larger capacity with power equal to or greater than single engine equipment . . . uses power and drive components that have proved their performance in other equipment on hundreds of jobs. Torque converters and semi-automatic transmissions assure easy operation and a smooth flow of power to meet all job conditions.

This TS-18 is one of Euclid's newest scraper models. It has a struck capacity of 18 cu. yds. . . . standard power is two 194 h.p. diesels with Torqmatic Drives. Western Contracting is using 10 of these "Euc" scrapers on the Indiana Turnpike.

There's twin power in these 50-ton Rear-Dumps too! Six of these big units, first used by Western on Ft. Randall Dam, are working under an 8 yd. dragline. With a total of 600 h.p. this "Euc" has plenty of power and traction to move capacity loads through loose sand and tough hauls.

"Performance far above expectations" is the way personnel on Western's job describe the overhung engine Twin-Power Scraper push loaded by the new Euclid Twin Crawler.

WESTERN CONTRACTING'S

7 million yard Indiana Turnpike job!

Western Contracting Corporation is grading 27 miles of the new Indiana Turnpike east of Elkhart. About 7 million yards must be moved by November, 1956—work is currently on a two 10-hour shift basis six days a week. It's a big job—one that demands dependable equipment that can move big loads fast . . . the kind of job where Euclid Twin-Power performance really pays off.

On one section of their contract Western is using five TS-18 Euclid overhung Twin-Power Scrapers and 2 "Euc" TC-12 Twin Crawler tractors. Working in sand, the "Euc Twins" pick up loads of 15 bank yards or more and make round trips of a mile every 5 minutes, each averaging 180 bank yards production per hour. They travel at speeds up to 30 m.p.h. with full payloads and make the return trip over good haul roads with a top speed of 35 m.p.h.

Five other Euclid Twin-Power Scrapers and two additional TC-12 tractors are making the dirt fly on another section of Western's contract. On still another part of the job six 50-ton "Eucs" are hauling from an 8 yd. dragline. These Rear-Dumps, veterans of Ft. Randall Dam, are powered by two diesels having a total of 600 h.p. For complete information on the complete line of Euclid earth moving equipment or models suited for your jobs, call your Euclid dealer soon.

As of June, 1955, these successful bidders on the Indiana Turnpike are depending on "Eucs" to keep their jobs on schedule:

Arcole-Midwest Corp.
Chapin & Chapin
A. L. Dougherty
Peter Kiewit & Sons' Co.
D. R. Smalley & Sons
Suber & Co. and Ballenger Paving Co.
Union Building & Construction Corp.
Western Contracting Corp.
Winston Bros.

● ● ●

Again "Eucs" outnumber all competitive rubber-tired equipment combined on a big turnpike project!

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

There's a Torcon unit to meet your job requirements

Here is a complete line of torque converters designed to meet a wide range of engine applications in all industrial fields.

The Clark Torcon unit is a three-element single stage converter of simple design, mass-produced. It is available off-the-shelf to owners and operators of equipment, as well as to manufacturers.

HORSEPOWER RANGE
. . . 15 to 600

DIAMETERS
. . . 11" to 26"

COMPLETE CHOICE
of options for easy fit into practically any torque transmission system.

For full information refer to illustrated easy-to-read Torcon bulletin.

CLARK EQUIPMENT

This helpful bulletin describes TORCON advantages . . .

Send for it

- **True Hydra-Foil Blade Design**
  —a patented feature. Correct combination of blade contour and angles assures smooth oil flow, for most efficient torque multiplication. No cavitation to cause turbulence or air pockets which impair efficiency and cause destructive wear.
- **Self-Contained Oil Circuit**
  —Sump is cast integral, and oil passages are cored in the housing. No unnecessary hoses and fittings; no external oil seals under pressure.
- **Easy Accessibility**
  —Inspection plates are easy to get at; no special tools needed.
- **Individually Cast One-Piece Elements**
  —no welds or fabrications to distort under extreme loads.

Every user of horsepower will find this bulletin well worth reading. The coupon brings your copy promptly—no obligation.

CLARK EQUIPMENT COMPANY
Jackson 5, Michigan

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CATERPILLAR ANNOUNCES

2 NEW TRAXCAVATORS

CATERPILLAR LEADERSHIP
IN ACTION

NEW
No. 955
1½-yd. capacity
CATERPILLAR
Balanced units
for bigger profits!
CATERPILLAR
NE
No.
1-yd.

"Big production" features of the new CAT No. 955 and No. 933 Traxcavators

40-DEGREE BUCKET TIP-BACK AT GROUND LEVEL. Tip-back action at low bucket height results in maximum possible loads every pass in any material—bigger production per day!

NEW OIL-TYPE CLUTCH. Stands up under continuous repeated use. Cuts maintenance costs and time two ways. (1) Clutch adjustment, while easy, is seldom required. (2) Plate replacement is often unnecessary even at engine overhaul.

Also helps step up production by providing easier shifting for operator!

MODERN HYDRAULIC SYSTEM. Hydraulically balanced vane-type pump insures delivery of full volume and pressure of oil for thousands of hours. Control valves located in tank receive maximum protection against damage and dirt. Closed hydraulic system—no vents or breathers—prevents entrance of dirt. Full-flow hydraulic system filter protects moving parts against abrasive particles in fluid. Filter handily located for easy replacement of element!

PLENTY OF POWER. Power is ample to "bury" the bucket and provide fast lifting action and positive dumping under all load conditions.

"DESIGNED-IN" COMFORT. Operator sits high, with excellent visibility of all bucket positions. All controls easy and convenient to operate—bucket control a one-hand operation! Pilot-house visibility—leisure-chair comfort.

PERFECT BALANCE. Weight distribution, engine horsepower and bucket capacity are balanced so that the full length of the track stays on the ground with a heaped load in the bucket.

NEW 3-GROUSER TRACK SHOES. Tested and proved on tough jobs, they deliver better traction—longer life!

OPTIONAL STARTING. Your choice of 6-volt electric starting for starting engine or 24-volt direct electric starting—from the seat, either way.

VERSATILE ATTACHMENTS. Your job range is increased by a variety of buckets and other useful attachments.

EW

933

capacity

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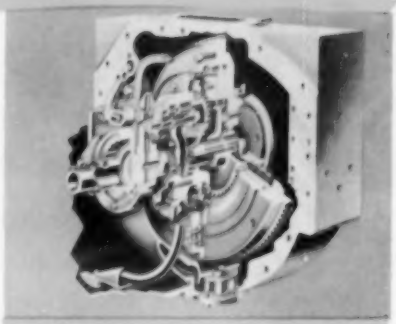
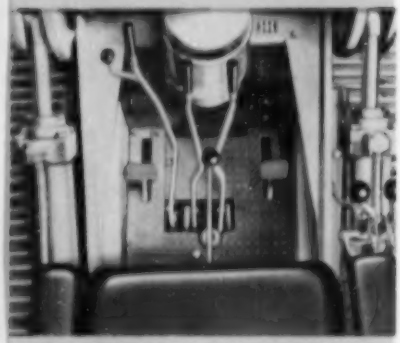
THLEHEM
THE ROPE

40-DEGREE BUCKET TIP-BACK AT GROUND LEVEL assures large loads every pass!



NEW OIL-TYPE CLUTCH sets new records for long life and minimum maintenance!

HIGH REACH with box-section lift arms for rugged service. Cross brace prevents twisting!



CONVENIENTLY LOCATED LIFT AND DUMP LEVERS provide one-hand operation!

HYDRAULIC FILTER IN HANDY LOCATION affords easy replacement of the element!

BRIEF SPECIFICATIONS

	No. 955	No. 933
Flywheel HP at sea level	70	50
Bucket capacity, cu. yd.	1½	1
Bucket tip-back at ground level, degrees	40	40
Bucket tip-back at max. lift, degrees	47½	48
Dumping height (center of hinge pin to ground)	128"	118½"
Weight (approx.) lb.	21,480	15,500

—AND MANY OTHER FEATURES!

Balanced for more work at less cost...

The new Caterpillar No. 955 and No. 933 Traxcavators

Designed from the ground up as excavating and loading machines, the new CAT* No. 955 and No. 933 Traxcavators are balanced *units*. Built and backed from tracks to buckets by *one* manufacturer, they also give you advantage of *one* service source—your nearby Caterpillar Dealer. With practical, advance-design features, they're engineered to *outproduce* ordinary tractor-shovels of equivalent size. You'll find these versatile units the handiest tools in your equipment line-up. Get the money-making picture from your Caterpillar Dealer—ask for a demonstration!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

MAIL TODAY!
CATERPILLAR TRACTOR CO., Peoria, Illinois, U.S.A.

I'd like more information on the new No. 933 and No. 955 Traxcavators.

Name_____

Company_____

Address_____

City_____ Zone_____ State_____

PRINTED IN U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NEW BIG-PRODUCTION TRAXCAVATORS

Wire Rope at Work—Probably many residents of Spokane, Wash., remember scenes like the one above, photographed while the new Coliseum was under construction. Now those curved steel beams support the roof of the finished structure, whose main enclosure is approximately 210 ft long by 125 ft wide. The largest civic auditorium in the Pacific Northwest, the Coliseum can be used for stage and trade shows, conventions, ice-skating, basketball, boxing, and other indoor activities.

Bethlehem wire rope, flexible and strong, was active during the building. Its chief job, of course, was the lifting of heavy loads, including the many roof beams. This it took in stride, performing reliably as always, and helping the steel-erection work to progress with unusual speed. A typical assignment for Bethlehem rope, which is at home on any type of construction project, large or small.

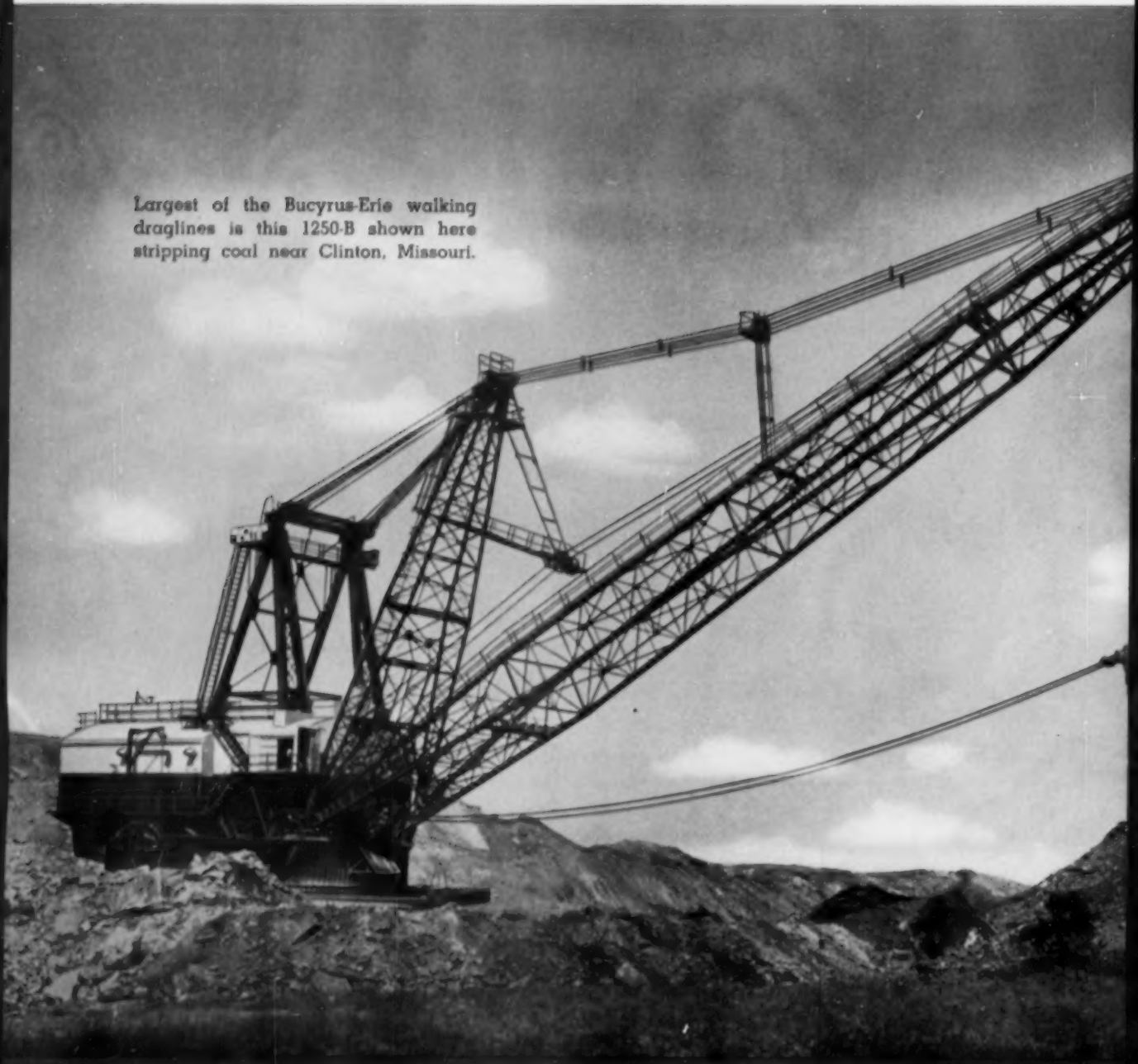
Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

CONSTRUCTION • MINING • PETROLEUM • EXCAVATING • QUARRYING • LOGGING • MANUFACTURING

BUCYRUS ERIE ...Maker of the

WALKING



Largest of the Bucyrus-Erie walking draglines is this 1250-B shown here stripping coal near Clinton, Missouri.

BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN

World's Largest Selection of

DRAGLINES

For efficient large-scale excavation, you will find a Bucyrus-Erie walking dragline to match your job. There are ten models, ranging from the readily dismantled and reassembled 180-W to the big 1250-B — the largest selection of walking draglines in the world.

Whatever size you choose, you are assured of the same dependable performance that has been characteristic of Bucyrus-Erie walking draglines for years. They have a front end design that combines great strength with light weight; the exclusive Bucyrus-Erie walking action with simplicity of design, cushioned action, and smooth fast moveups; and Ward Leonard variable voltage control on all electric powered machines — plus many other features which have made them famous the world over.

Whenever a job involves huge yardages, a Bucyrus-Erie walking dragline — in a size to fit your needs — is a dependable way to economical output. 37155C

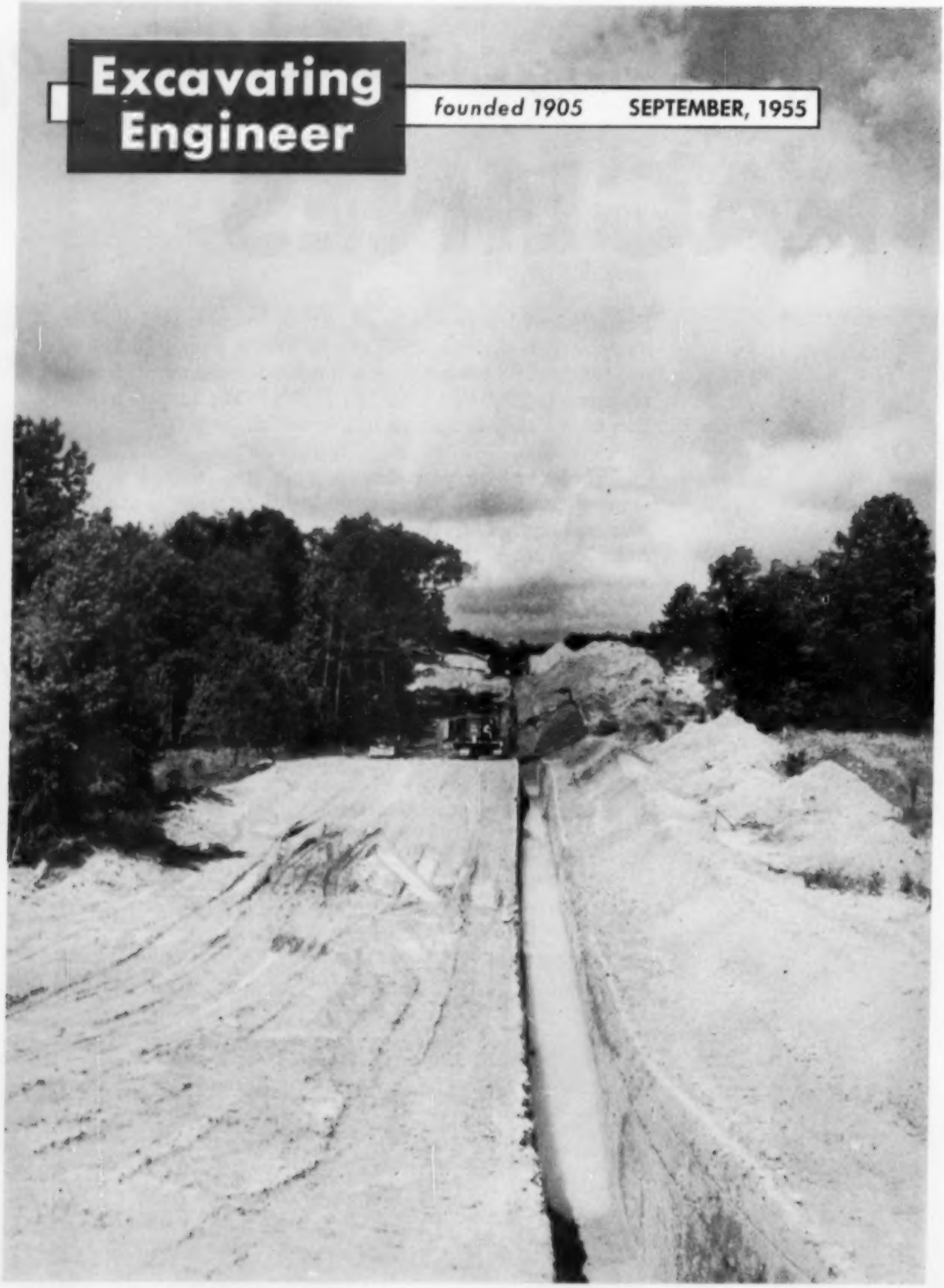
The 180-W, smallest of the Bucyrus-Erie "walkers", is shown here building an earth dam for a settling area in a Florida phosphate mine.

1880 — 75 Years of Service to Men Who Shape the Earth — 1955

BUCYRUS-ERIE COMPANY

Excavating Engineer

founded 1905 SEPTEMBER, 1955



Two 22-B dragshovels work near Alexander City, Ala., on the Houston Contracting Co. and H. C. Price Co. pipeline contract.

Pipeline Loop Program Progresses

On the O. R. Burden Construction Co. spread near St. Francisville, La., a Cat dozer works on an access road to Thompsons Creek.

The $83 million Texas to New York main line looping program involves eight separate construction projects as part of Transcontinental Gas Pipe Line Corporation's expansion program.

FORTY-EIGHT public utility, industrial and municipal customers of Transcontinental Gas Pipe Line Corp. will receive increases in their allocations of natural gas when expanded facilities based on an $83 million construction program are placed in operation. The expansion program involves 23 separate construction projects in 11 states along the line from Texas to New York. Work on all of these was proceeding simultaneously. Completion was scheduled for the 1955-'56 heating season.

An additional 130 million cubic feet of daily capacity will be made available by the new construction. Daily capacity will be boosted from 565 to 695 million cubic feet of natural gas. Peak day capacity will be increased to 831 million cubic feet, including deliveries from storage.

Here is how some customers will fare in the New York area: the daily allocation to Consolidated Edison Co. will be increased from 138 million to 144 million cubic feet; Brooklyn Union Gas Co., from 80 million to 85 million; Brooklyn Borough Gas Co., from 9 million to 10 million, and Kings County Lighting Co., from 9 million to 9½ million.

In New Jersey, the daily allocation to the Public Service Electric & Gas Co. will be increased from 74 million to 99 million cubic feet; to the Elizabethtown Consolidated Gas Co., from 16 million to 21 million, and to the South Jersey Gas Co., from 21 million to 30 million.

In Philadelphia, Pa., the daily allocation to the United Gas Improvement Co. will be increased from 26 million to 41 million cubic feet.

South of the Potomac, the largest daily increases will go to the Piedmont Natural Gas Co., from 23 million to 35 million cubic feet, and the Public Service Co. of North Carolina, from 16 million to 25 million.

Major construction projects to be carried out this year include the laying of 315 miles of 36-in. pipe, 219 miles of 30-in. pipe and 60 miles of smaller diameter pipe. Additional crossings of the Potomac and Savannah rivers and the building of new compressor stations in Texas and Louisiana are also on the agenda. Approximately 45% of the company's transmission line from the gas producing areas to New York City will have been looped when this year's construction projects are completed.

Last year Transcontinental pioneered use of giant 36-in. pipe by laying 47 miles of it in Mississippi and Alabama;

Heavy spring rains which flooded and sometimes filled in pipeline ditches slowed operations on the project. An Insley clamshell is shown redigging the hard-packed silt.

Seven Lincoln 300-amp. welding units are shown behind a compresser station.

pipe this large was new to main line construction. Super-inch pipe will transport 60% more gas than a 30-in. line and almost three times as much as a 24-in. line.

Louisiana

One of the seven contracting firms on eight main line loop contracts was the O. R. Burden Construction Corp. of Tulsa, Okla. Its contract consisted of two sections. One section was a 5.31-mile loop of 36-in. pipe near St. Francisville, La. The other section was a 25.39-mile loop of 30-in. pipe near New Roads, La.

In order to expedite the work and use of machines, the two sections contracted were split into three work sections by the Burden Co. Section No. 1, running from a main line valve near Waxia in St. Landry Parish to the main line valve on the west bank of the Atchafalaya River, was approximately 13 miles long. This work included looping with 30-in. line, installation of main line block valve and cross-over line and tie-in at the Atchafalaya River crossing bridge.

Section No. 2, approximately 12 miles of 30-in. pipe, was to tie in at a main line valve about three miles south of Morganza and run to the connecting valve on the west bank of the Mississippi River. Section No. 3, the shortest of the sections—5.31 miles—ran from the east bank of the Mississippi River to tie in at Transco's compressor station No. 6, eight miles southwest of St. Francisville.

Work, under direction of Superintendent A. B. Haynes, was progressing on Burden's section No. 3 with 36-in. pipe when *Excavating Engineer* visited the spread. It was planned to finish the job east of the Mississippi River before starting work on the other sections. A mass move was being scheduled, which included 70 miles of travel and the use of two ferrys to get the heavy equipment across the Mississippi.

Although most equipment was concentrated on section No. 3, the right-of-way (ROW) crew, with Dick Barton in charge, used four Caterpillar D7 dozers, a D8 tree dozer with custom built tree blade and three Ford winch trucks to prepare a 50-ft. right-of-way for the coming activities on section No. 1. Preparing for the start of ditching work on this section were four ¾-yd. dragshovels—three Bucyrus-Erie 22-Bs and one Insley—two Bucyrus-Erie 22-B draglines and one Insley dragline.

Work on section No. 3 had been going on schedule until heavy May showers delayed progress. The ROW crew was held up about a week by the heavy rains and after pipe laying started, foreman Kermit Lake in charge, a 3-in. rain held up operations for two days. The Mississippi River overflowed its banks at one stage during the rains. Thompsons Creek ran over its banks twice. A mile of swamp which is part of the Burden section No. 3 job was flooded with five feet of water.

Flooding along Thompsons Creek was giving the ditching crew some problems. Although normal ditch depth was 6 feet —3 ft. cover on 36-in. pipe—the cover at the stream crossing was to be six feet in the center of the creek. This called for ditching across the stream of not less than nine feet. In places, on the creek bank, the ditch was 20-ft. deep. Overall width of the stream and banks called for a 600-ft. crossing.

The extra depth of cover was required because of the varying flow of water in the stream and rapid channel changes that take place during rainy

In flooded swampland, concrete river weights were used by the Burden crew. Water in the swamp reached depths of five feet and caused slowdowns at other points.

periods. When the rains came, in early May, the crossing job had begun and Griffin well points and Le Roi pumps had been installed in the ditching area along the bank. Flood waters covered the area and rose so fast that two pumps were turned over before they could be removed.

Crossing the swamp presented another big problem for superintendent Haynes and his pipe laying crew. Here the pipe was floated into position, then filled with sufficient water to sink it. Enough concrete river weights were added to give it a permanent negative buoyancy. Because there was little back-fill material available from the water-filled ditch, it was necessary for a dragline to pull in additional cover. Later a pig and an Ingersoll-Rand 600 compressor were used for the removal of water and subsequent cleaning of this section of pipe.

Water. That was the big problem in the bayou country. It plagued the pipeline contractor in the form of frequent rain, rivers, creeks and swamps. Remove this one factor and the story might have been quite different. The valley of the Mississippi is not necessarily easy country, however, for nearly 50% of the line runs through heavy timber and rolling country. There was very little blasting required. Excavated material was mostly clay and sand.

Sub-contracting the stringing for O. R. Burden Co. was J. O. (Red) Willett. Secrest Pipe Coating Co. had the sub-contract for pipe doping.

In addition to the ROW crew and equipment on section No. 1 and the equipment awaiting ditching operations at Mellville on section No. 2, Burden had full crews in operation on section No. 3. Two Cat D7 sideboom rigs and a D7 sideboom working with a CRC bending machine were used by Nevell Mangum and his bending crew. The pipe gang, using a D4 tow Cat, two D7 sidebooms, a TD-18 International winch tractor and two 300-amp. tractor mounted welding machines, was supervised by Kermit Lake. Welding, with Bill Broderson in charge, was done with a TD-18 winch tractor mounted with two 300-amp. Lincoln welders, for the hot pass, and 10 trailer-mounted 300-amp. Lincoln welders to put on the final bead. A D4 tow cat worked with the welders on a shuttle system.

Final doping was done with a 25-bbl.

Associated Pipe Line Contractors, Inc., used two 405 Koehring 1-yd. dragshovels for ditching on special assignments on its spread of 63½ miles through Mississippi.

One of the 14 Lincoln 200-amp. welders used by Associated's back gang is shown here being towed by an International TD-18 crawler for spotting beyond a road crossing.

Original ditching for Associated was done by two Cleveland 320 trenchers, one of which is shown here. They ditched to a depth of 6½ feet to allow a 30-in. cover.

The hot pass crew is shown here next to the water-filled ditch. It used four Lincoln 300-amp. welders mounted on a GMC 6 x 6 truck. Red Willett subbed the stringing.

Crose dope pot towed by a D4 Cat and an International 6 x 6 truck. Clayton Brockleman was in charge. The lowering-in gang used two Allis-Chalmers HD-20 tractors with sidebooms, two HD-15s with sidebooms, a D7, one Ford F-6 winch truck mounting two 200-amp. Lincoln welders and a 25-bbl. Crose dope pot. Clean-up was accomplished by C. P. Houston's crew and two D7 angle dozers, a TD-24 angle dozer, one D4 with a farm disc and a Ford F-6 winch truck. Marshall Waites was project engineer and DeWitt McLallen was O. R. Burden's bookkeeper on the job.

Maintenance of all equipment was handled by three mechanics and a two-man grease truck which worked on a rotation system. Inspectors for Transcontinental Gas Pipe Line Corp. were W. H. Bowersox, chief inspector; R. B. Hayes, welding; Louis Mire, cleanup; Elbert Hunt, utility; Rodney De Roven, coating, and J. C. Adam, coating.

A CRC bending machine, International-powered, and a Cat D7 are shown here.

Mississippi

Moving up the line (southwest to northeast) from the O. R. Burden spread, which was the westernmost point at which present loop line work was being done, Associated Pipe Line Contractors, Inc., of Houston, Tex., had the next section. Its job was 63.45 miles of 36-in. loop line. This section was split into two work sections.

Associated laid about 30 miles of

loop line last year from Magnolia, Miss., to the vicinity of White Bluff, just west of the Pearl River near Prentiss, Miss. This year it was extending in both directions from the existing loop—eastward from White Bluff to Collins, Miss., and westward from Magnolia, Miss. to Clinton, La.

Starting at White Bluff, the first obstacle was the Pearl River. There, to provide a 5-ft. cover for the pipe, it was necessary to dig an 8-ft. ditch. An 8-in. suction dredge and a No. 6 Northwest dragline were used for the job. The river crossing was separated from the main line crossing by 100 feet, compared to a distance of 47 feet separating the main line and loop lines in the rest of the contract.

"Hope to God it quits this raining. We're getting behind," E. D. Singleton, superintendent on the Associated spread said as *Excavating Engineer* accompanied him on his rounds. Singleton was on the 'go' constantly. Between stops, coordination of effort continued through radio contact with the field office at Prentiss or with one of the foremen or mechanics. At each stop "E. D." went into quiet conference with one or more of the men in charge. Extra effort was being put forth because of the slowdown caused by the heavy rains.

At a half dozen places along the line it was necessary to retrace to clean out sags in the ditch caused by the rain-washed ground. Between each rolling

Pipe is being positioned for joining by the welding crew with a Caterpillar D8 sideboom. Another D8 pulls three tracked-trailer-mounted 250-amp. Lincoln welders.

From the road crossing along state highway 13, near Prentiss, Miss., a model L Insley and a model 25 Northwest clamshell are seen cleaning out dirt washed in by rain.

One of the Bucyrus-Erie 22-B dragshovels on the Houston Contracting Co.-H. C. Price Co. job is shown near Alexander City, Ala.

An Allis-Chalmers HD-20 carries Chicago Pneumatic wagon drills and tows a No. 600 compressor as it moves up to another rock section. In background, 22-B digs on road.

hill water was standing in pockets. Swamps were flooded. The men in charge, as well as operators, glanced skyward from time to time as if expecting another downpour.

Good weather had returned, for several days at least, and although the air was heavy and hot, the work crews were again gaining momentum. Swamps, quicksand and other obstacles common to the delta country were also common to the Associated crews who had worked this area before. It took special efforts by nature to slow them.

The ROW crew, using four D7 dozers and one D8 along with power saws, was well ahead of ditching crews, although 60% of the job was heavy timber. Large trees were sawed and the rest dozed into piles for burning. Dick Hawthorne was foreman of the grade and ROW crews.

Ditching, under Sep Dolan, was done with two Cleveland 320 trenchers to a depth of 6½ feet to allow a 30-in. cover. Several Koehring 405 1-yd. dragshovels were used on special ditching jobs. A Northwest 25 and a Model L Insley, both clamshells, were used to clean out where rains filled the ditch.

Stringing was subbed out to Red Wil-

lett. Coating and wrapping was subbed out to Rosson-Richards. The bending crew, using a D7 sideboom and CRC International-powered bending machine, was in charge of Woody B. Hayes.

Welding crews for the hot pass used four 300-amp. Lincoln welders mounted on a GMC 6 x 6 truck, three 250-amp. Lincoln welders on a tracked trailer and a Caterpillar D8 sideboom. Another D8 was used to pull the trailer. N. Weaver was in charge. The filler crew used 14 Lincoln 200-amp. welders, individually mounted on steel pipe sleds. A TD-18 International worked as a tow tractor for the sleds.

In charge of pipe lowering and tying-in was Bob Josey. C. E. Brocksmith was in charge of river crossings, Henry Nevels handled dope and Ray Isgitt and R. N. Cain were bookkeepers.

Mississippi-Alabama

Handling 68.08 miles of main line work in Mississippi and Alabama—almost all of it in western Alabama—was Midwestern Constructors, Inc., of Tulsa, Okla. The construction included 14.51 miles of 30-in. pipe and 53.57 miles of 36-in. pipe.

John Work was the superintendent. N. O. Boies was office manager and C. C. Boies was the timekeeper.

Alabama-Georgia

Skipping up the line from Mississippi to Alexander City, Ala., the Houston Contracting Co., Houston, Tex., in a joint venture with H. C. Price Co., had 84.67 miles of 36-in. loop line to lay. Their contract covered the area between Rockford, Ala., and Newnan, Ga. Clearing started early in April and pipe laying began early in May. Once again the complaint of the field superintendent, W. H. Hayes, was a slow-down due to the weather: Rain.

Operations were interrupted by five days of heavy rain. Ditches were filled with silt, ditch walls caved in, hillsides washed in and ravines were water-filled. Padded rock base had to be repadded and ravines had to be redug.

A general slow-down was caused in the area which presents, by itself, some very rough country. Hills were more pronounced. Considerable rock drilling and blasting were necessary. More pipe padding, protection from rock, and bending were required.

At the time of *Excavating Engineer's* visit in late May, the job was returning to normal, although the threat of more rain was ever present. About 51 miles of the total of 84.67 had been cleared, 34 miles graded, 27 ditched and 15 miles of pipe lowered in. Rock ditch made up about 22 miles of the total.

Working out of Alexander City, the job was proceeding steadily eastward from Rockford, Ala. Plans were to go straight through, tying into the main line as each of the six tie-ins was reached. The loop line was being laid 50 feet from the main line.

Three river crossings were included in The Houston Contracting Co.-H. C. Price Co. contract. All flowed on solid rock at the cross-over point and all required a 4-ft. cover under the river bed. Drilling and shooting were being done

Lowering-in equipment comes up as 22-B (left) digs in rock. Another 22-B (right) lowers Oliver OC-3 for ditch-bottom cleanup.

under a sub-contract by H. W. Peerson Drilling Co., using small rotary rigs on barges. Crossings were at Hillabee Creek, Tallapoosa River and Chattahoochee River. J. C. Jack was in charge of these operations.

Right-of-way work, which began the first week in April, consisted mainly of brush and timber clearing. To accomplish this, C. L. Farris and his crew used an International TD-14, two Caterpillar D7 dozers with brush blades, one Ford F-7 flatbed truck, two Littlejohns saws and six chain saws. The grading crew foreman was Thomas Glen. Five D8 and two D7 Caterpillar dozers were used for this work.

Nolan Ary was in charge of the ditching crew which kicked off April 19. Two Buckeye ditchers, a Model 51 and a Model 41, were teamed up with five ¾-yd. Bucyrus-Erie 22-B dragshovels for the rock and gully work. One International TD-18 tractor and a Caterpillar D7 dozer worked with the ditching team on cleaning, towing and hill-holding assignments.

Probably the smallest dozer ever used on a pipe line assignment was also a part of the equipment. It was an Oliver OC3 with a blade just wide enough to clear the ditch bottom. This dwarf among the giants was lowered to the bottom of the ditch where it cleaned out fall-in and other minor obstacles. It also had the effect of checking ditch width at the bottom while replacing larger equipment.

The rock gang kicked off April 24 and Clyde Breedlove, foreman, and his men had approximately 30% of the total mileage to drill and shoot. Hercules powder was used. A D8 dozer pulling a Gar Wood ripper opened the way for drilling. Two Chicago Pneumatic wagon drills were mounted on Allis-Chalmers HD-20 tractors. They were trailed by two No. 600 Chicago Pneumatic compressors. One Caterpillar D7 sideboom, a D6 dozer and four Cleveland jackhammers completed the equipment.

Bending was done by Bill Boyd's gang with Kelly Cook as engineer. A Cinch bending machine was served by a D7 and D8 sideboom. Laying-in was done with two D7 sidebooms. Two 250-amp. Lincoln Welders, on Athey wagons drawn by an International TD-14 tractor, a Ford gang truck and a utility pick-up truck completed the equipment.

The welders, with O. L. Townsend as foreman, used three 300-amp. and one 250-amp. Lincoln welding units and an International TD-18 tractor on the hot pass. The back gang of 21 welders used 21 Lincoln 200-amp. welders. These units were mounted two to a sled. Two TD-14 tractors shuttled them into position.

Following the welding crews, the dope gang, with C. G. Miller in charge, worked with a CRC cleaning machine and a Crose coating and wrapping unit. Two crawlers, an HD-20 Allis-Chalmers and an International TD-18, pulled the three 30-bbl., one 27-bbl. dope pots. A Caterpillar D8 sideboom and a new

An International-powered CRC cleaning machine works on the 84.67 miles of 36-in. line between Rockford, Ala., and Newnan, Ga.

Loading the CRC cleaning machine through a water-filled hollow is an Allis-Chalmers HD-20 mounting a Tractomotive sideboom. A Crose coating, wrapping unit was used.

Caterpillar 583 pipelayer were used with the coating and wrapping operation.

Lowering-in was handled by four HD-20s and one D8, all sideboom mounted, a D6 hi-lift, a TD-18 tow cat and 10-bbl. dope pot and two excavator units. One of the excavators was a 22-B with ¾-yd. clamshell bucket and the other a Lorain 1-yd. L-51. J. V. Hayes was foreman of the crew.

The road crossing gang, with W. E. Windham in charge, worked with a Caterpillar D8 sideboom and a Crose boring machine. With a 3-ft. cover required at drainage ditches, a 42-in. casing followed the boring machine through and the pipe was pulled through while the casing remained. Cleanup, with T. O. Diffie in charge, was done with two Caterpillar D8 and two D7 dozers and a Model 12 Cat motor grader.

Lewis Young assisted superintendent Hayes. Sam Harrison and Roy Stevenson were field office managers.

Georgia-South Carolina

Western Constructors, Austin, Texas, was awarded a spread of 76.87 miles of 36 in. pipe—62.61 miles in Georgia and 14.26 miles in South Carolina. Through late June, about 32 miles of the pipe had been installed.

Jack Hodges was superintendent of the spread. Others involved in the operation included: Dunn Brothers Trucking Co., which sub-contracted for the stringing; A. G. Goyne, office manager; R. E. McManus, timekeeper; and R. V. (Pete) McGehee, chief inspector, and A. L. Richards, welding inspector for Transco.

North Carolina

Panama-Williams Pipe Line Contractors, Houston, Texas had 36.14 miles of 30-in. and 31.22 miles of 36-in. loop line to lay in North Carolina. One section ran from Gastonia to Lexington,

Continued on page 60

A Mack truck (left) hauls dope in chunks to site. A Caterpillar 583 pipelayer (right) pulls another crawler-mounted dope pot.

Rock for the Missouri River dike and revetment restoration program came from four quarry sites. Here, a 38-B loads a truck.

Machines Help Tame Big Muddy

by Ray Day

General superintendent of the joint-venturers' combine was Lewis Fisher.

FOR 60 miles along the lower Missouri River between the towns of Steedman and Washington, Mo., a joint-venture firm of Texas contractors recently demonstrated again that a quiet revolution is taking place in the mode of work along Big Muddy. A dike and revetment restoration program, which formerly would have demanded labor crews totaling at least 300 men, was done quickly and quietly with a crew of only 32 men. Credit for the performance goes to men who recognized what modern land-based machinery could do on water.

Mid-Continent Stone & Construction Co., Dallas, Tex., was the firm which worked four rock quarry sites along both sides of the lower Missouri River throughout the fall, winter and spring of 1954-'55. Markham & Brown, and Mississippi Valley Engineering & Construction Co., also of Dallas, were the joint-venture contractors who teamed up successfully to bid the Corps of Engineers contract. Started last Oct. 16, the work carried on through the fiscal year ending June 30. Construction was done in all but a few weeks of the winter when heavy floating ice conditions in the Missouri made it impossible to continue operations.

Several types of work were included in the contract, which was designed principally to rehabilitate, repair and restore wooden pile dikes and rock-revetted channel lines to full efficiency. Approximately 150,000 tons of limestone was planned for production from four quarry sites to strengthen and fill in around wood pile clusters in the old dikelines. This went in at rates varying from 2 to 5 tons per linear foot of dike. There was 2,880 feet of 8-ft. bottom width ditch to dig along one proposed channel line, in which approximately

Traditional dike and revetment work along lower Missouri River changes radically. Quarry, dikeline-ballast work, formerly done by 300-man labor crews, is handled by machines and 32 men.

30,000 tons of limestone were placed in order to establish a controlled future river bank. Construction of this revetted point, along with the production of stone, was the purpose of Mid-Continent Stone & Construction Company's work.

The job also included driving yellow-pine and cypress piling as short extensions and single-row backup behind existing dike lines. There also was some new dike construction. This pile driving was a direct function of the joint venturers, Markham & Brown, and Mississippi Valley Engineering and Construction Co. The first dike worked on was located on the Callaway County shore along the left bank, three miles above Steedman. The last dike in the contract was four miles above Washington along the Franklin County shore on the right bank of the river.

Climaxes Long Battle

This construction work climaxes a battle of more than 50 years along the Missouri River. There was not a single year in the half-century that residents along the lowlands and both banks of the river were entirely free of danger from its rampages. From its headwaters in Gallatin County, Mont., on down past the mouth of the Yellowstone, through the Dakotas and in the vast fertile agricultural valleys of Iowa, Kansas and Missouri, Big Muddy long has been resentful of man's control. For decades the Missouri was a stream of shifting channels, tricky sand bars and snags and banks which eroded so rapidly and quietly that whole farms frequently were lost in the old days. The first early projects along the stream, from 1875 to 1900, were designed merely to hold eroding banks and stave off disaster. It was much like giving a cancer patient aspirin.

The first long-range river control program began about 1925. Permeable pile dikes were driven at strategic locations to force the river channel into predetermined lines. The standard structures of that day consisted of two or three-row clumps of three pilings each, driven usually to a penetration of from 20 to 32 feet. Mats from 77 to 100 ft. wide, built of willows or 1 x 4 lumber, were woven coincidentally with pile driving and then were weighted down to the bottom of the river with rock to prevent the sand bottom from scouring. Then, as now, the dikelines were ballasted some between pile structures with limestone rock, which is common along the Missouri River bluffs throughout the lower valleys.

All quarry drilling on the project was done by this Bucyrus-Erie 20-W, owned by A. F. Hughes of Pangburn, Ark. Here, the 20-W drills a 5⅛-in. diameter powder hole.

Although there were many troublesome places which seemed to defy all man's efforts—among them the White Cloud crossing in Kansas, the river near Lexington, Mo., and the famous Dundee Crossing just above Washington—these works largely were successful. Reaching far out into the river, the dikes successfully moved the channel over to predetermined lines. In time, permanent banks formed. During periods of high water, the river deposited millions of tons of silt behind these structures, and by 1938 or 1939, the permanent banks of the stream were fairly well established.

Decade of Maintenance

The decade between 1940 and 1950 was one of maintenance dredging and restoration work on dikes. During winter high-water periods, floating ice tore out dike sections. This work was done largely with government-owned dredges of the suction dustpan-type, and by government-hired labor fleets which have been traditional along the Missouri River. By 1950, the channel had been sufficiently stabilized so that more barge-line freight began to move down the river from terminals in Kansas City and beyond. Completion of important dams in the headwaters of the Missouri—dams like Fort Peck, Kortes, Boysen, Canyon Ferry—and impoundments in the reservoirs of Garrison, Fort Randall, Oahe, Gavins Point and other important locations will do much to stabilize the flow of water down stream. By the summer of 1954, all of these works had been advanced sufficiently so that hydraulic engineers of the Kansas City office of the Corps of Engineers could visualize a nine-foot navigable channel between Sioux City, Iowa, and the mouth of the river. If the ends of the wood-pile dikes, the bank line revetments and trail dikes can be preserved by the type of contract construction now being used,

Continued on page 38

Tractor-wise Owners and Operators ...in New International

"IT CAN SELF-LOAD AND DELIVER FASTEST"—"International TD-18A improvements like the new 300% stronger track frames and cartridge-type track roller seals increase production, machine life, and operating ease. As for power, our new TD-18A can self-load the 8-11 cubic yard scraper and deliver fastest of any crawler we ever had." *Here's proof extra traction matches the TD-18A's power increase!* G. W. Owen, Warden, Henry County Public Works, McDonough, Georgia.

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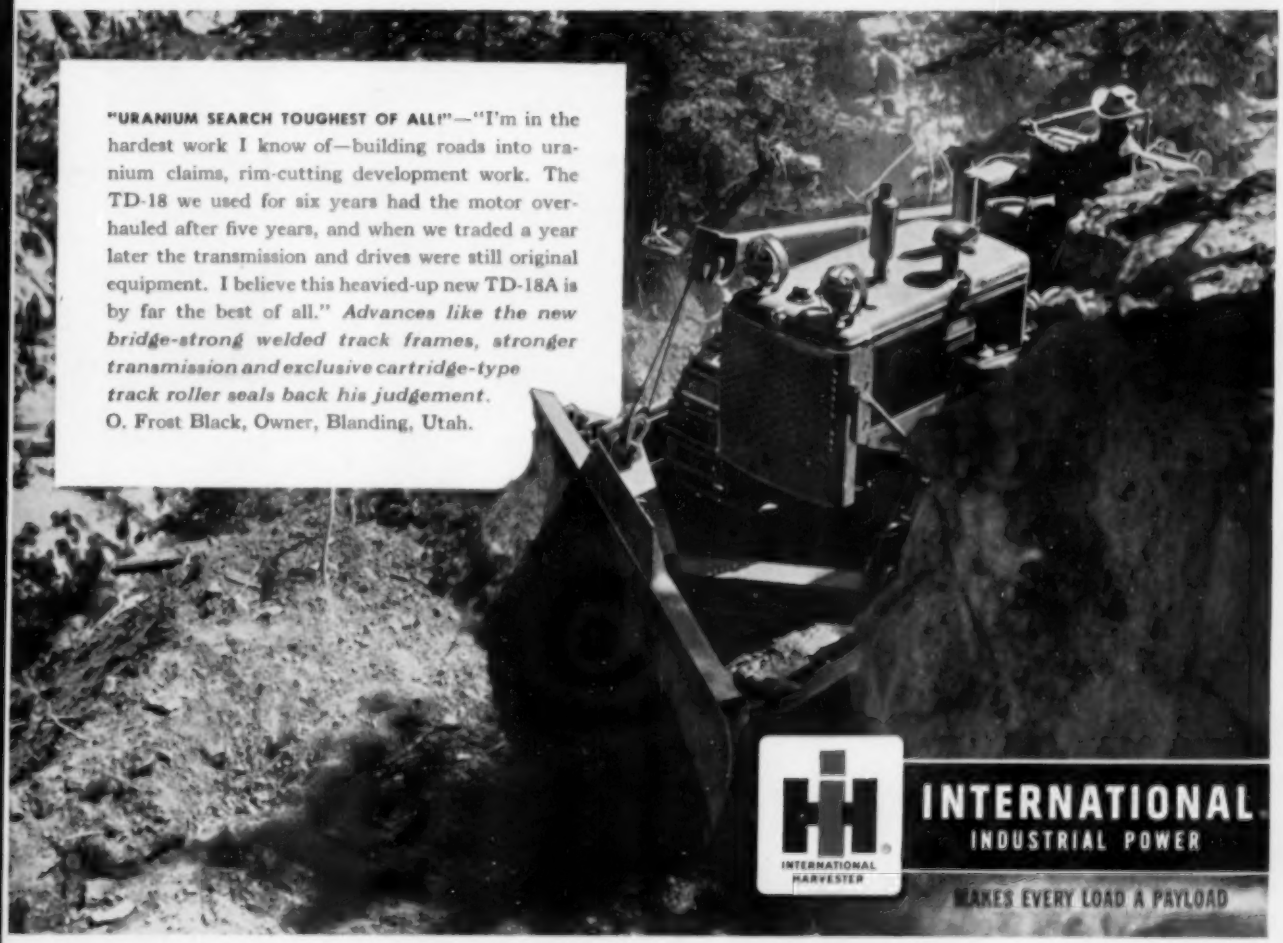
"OPERATORS FIGHT FOR NEW TD-18A"—"The TD-18A's were always good—fast, trouble-free performance and low operating cost made me money. The new TD-18A is stronger and really planned for the man in the seat. It has operators fighting for it." *Big, wide, comfortable cushions; hydraulic steering control boosters, and levers are conveniently grouped on the roomy, non-skid deck!* M. B. McKee, Chickasha, Oklahoma.

"LESS FATIGUE TO STRIP MORE COAL"—"There are two outstanding reasons why I like my new design International TD-18A. First it's designed to strip rugged terrain. And second, the operator can do more with less fatigue. The extended tracks enable working steep terrain with maximum production and safety." *Tough jobs, like coal-stripping, prove the TD-18A excels in ample new gear train strength, too!* Elmer Phillips General Manager, Little Beaver Mining Corporation, Beckley, West Virginia.

Report on the Decisive Difference

TD-18A Performance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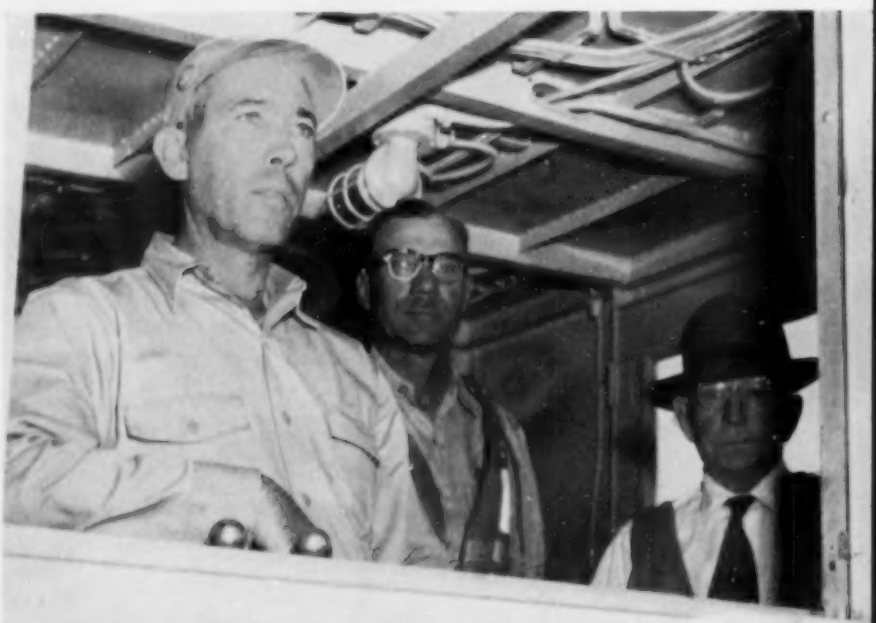
A Ford truck dumps a load of rock on the steel barge as the towboat *Phoebe Jinnette* stands by for trip down the muddy Missouri.

Big Muddy . . .

Continued from page 35

the engineers believe that a stabilized nine-foot navigation channel in the lower Missouri is a certainty.

The growing realization that modern drilling and rock excavation equipment could do a faster, more consistent and cheaper job of producing the rock gradually introduced the machine age to an undertaking which traditionally had been done by hand labor. In many respects, machine-produced stone is superior to the old type. In the days of big labor crews, stone had to be broken down so that it could be handled by one man. And the specifications of that early era even used that terminology: "one man stone." Today, however, machines like the Bucyrus-Erie 38-B power shovel with its 1½-yd. dipper, which the



Aboard the boat as it moves downstream are (from left) Capt. Ted Routon; William D. Crump, Corps of Engineers inspector; F. W. Day, veteran quarry man.

joint-venture contractors used in the quarries, produce and deliver stone heavy enough to resist any force the river can impose. The material now can be handled rapidly and at high speed. A barge carrying 140 cubic yards formerly was considered a good day's work for a 30-man unloading gang. Today, however, 1,800 tons of much heavier and better material can be handled in the same period by only two tractor operators.

With newer and more ingenious methods firmly established and others being introduced to river work along the lower Missouri, it was almost inevitable that there would be a return to the contract system. For many years at its national conventions, in close co-operation with such agencies as the Corps of Engineers, the Bureau of Reclamation, the Navy's Bureau of Yards and Docks, the Civil Aeronautics Authority and others, the Associated General Contractors of America urged that the government award its contract work to responsible, reputable bidders willing to gamble privately invested money on that work.

Four Quarry Sites Worked

In doing the 60-mile river job, four quarry sites were worked, beginning at the upper end of the job and moving downstream. The first quarry was located near Steedman, along a high Missouri River bluff where flat limestone layers predominated. The next quarry site was located just north of the Missouri, Kansas and Texas railroad tracks at Bluffton, Mo., where rock production for Missouri River work has continued for many years as various governmental contracting agencies did jobs in that area. The Bluffton quarry was the largest of the four and had the highest rock face. When quarrying was finished at Bluffton, operations moved downstream to Bernheimer, in Warren County, where one of the best rock sites was available. The last quarry site, which was operating when *Excavating Engineer* visited the project, was located five miles west of Washington in a limestone deposit south of state Route 100.

Moves of construction equipment between these four locations were interesting. The river fleet, of course, was towed directly downstream by two towboats maintained by the company. But heavy drilling and power shovel equipment had to move over state highways on low-bed trailers. Missouri's highway regulations are strict, compared to states around it, and it was necessary in the case of the 38-B shovel, for example, to remove the boom, tracks and some other equipment to lighten the load sufficiently for over-the-road travel.

High Production Quarry Methods

Quarrying methods used were far different than those of 20, 30 or 40 years ago. The latest and most modern tricks for removing rock at high capacity were used throughout the job. One of the first such examples was the use of the big-diameter powder hole technique in drilling and blasting the rock loose, prior to loading with a power shovel. A drilling subcontract was arranged for this item with A. F. Hughes of Pangburn, Ark., a firm specializing normally in the drilling of water wells. Hughes owns, among other machines, a new Bucyrus-Erie 20-W water well rig, which was made to order for drilling the necessary powder holes. Handling a tool string which included a 4½-in. stem 16 ft. long and weighing about 900 pounds, the machine swung approximately 1,400 pounds to sink 5⅞-in. holes at an average rate of about five feet per hour.

The drill hole spacing in all cases was 18 feet back from the face of the rock cut, with drill holes 21 feet apart. In some cases, more than one row of holes behind the face was drilled, but if this was done it was on a straight grid rather than a staggered pattern. Drill hole excavation was carried down about four feet below the normal grade of the quarry floor, so that excellent toe breakout could be established without excessive secondary drilling. What little secondary breakage resulted was limited. It was handled easily by a Bucyrus-Erie

Aboard the barge as it heads for a job on one of the dikes are two International TD-14A crawlers. One has Hough front-end loader. Other has Drott skid-loader.

22-B crane with a 45-ft. boom, carrying a 2,000-lb. skull-cracker.

The deepest drill hole was 99 ft. deep and was located at Bluffton quarry. The hole was drilled five feet below grade in this case, which made the Bluffton quarry face 94 ft. high. Several types of powder were used, including DuPont's Red Cross, Gelex and 60% special gelatin. The shots were pulled electrically by hooking each hole to a Primacord trunk line and firing the shots from an electric power source.

Some of the quarry blasting conditions were unusual enough to call for special treatment in the explosions. The Bluffton quarry, for example, sat practically alongside the M, K & T railroad tracks. It was necessary to control the blasts so that large rock could be kept away from telephone and telegraph power lines and the railroad tracks. This control was established accurately by using delays up to 17 milliseconds. In some cases, where it was necessary to hold the broken stone within a very short area, the delays were arranged so that the holes farthest inside the rock face exploded first, with the outside holes breaking into the bank. In other cases, the broken rock was thrown to one side in the corner, typified by the Washington quarry, for example, where the breakout was directed toward the northwest corner. This corner was closest to the hauling road, and the trucks and power shovels were able to do a better job on the toe of the rock pile. The explosive ratio was calculated on the basis of 3.6 tons of broken rock (solid bank measurement) per pound of powder. With this explosive ratio, an excellent degree of breakage resulted, so that the 1½-yd. dipper on the 38-B could load the material without excessive secondary breakage.

11,000-Ton Shot

The drilling and powder work generally was carried on approximately ten days to three weeks before the 38-B moved in to load. The biggest single blast at any of the quarries was an 11,000-ton shot, at Bluffton during the winter of 1954-'55.

The broken-out rock, heaped along the quarry toe in a neat pile, was loaded out at high speed by Mid-Continent's new 38-B. This machine was powered by a Caterpillar D364 diesel engine and was equipped with a torque converter between the diesel and the drums. Digging at near capacity, at a time when there were enough trucks on the job to haul away the machine's output, several 8-hour 2,200-ton days were established.

It must be emphasized, however, that the production of stone for a Missouri River job now is controlled by the same factors as it was 20 years ago. The pacesetting operation on a river job is the construction of the pile dikes. The production of stone must be geared to whatever rate of speed the other parts of the job are able to establish. So it was in this case, with the quarry simply keeping up with the piledriver crew as it moved down the river strengthening

As barge comes into the dike, damaged piles can be seen. Rock dikeline ballast will strengthen dikes and stabilize banklines.

With the barge secured, the Internationals begin unloading the rock. Machines could move about 1,800 tons in an 8-hour shift.

the old dikes or driving new extensions. In cases where nothing was done to a dike except to strengthen the structure by the addition of rock ballast, the work proceeded unimpeded.

When *Excavating Engineer* visited the job, the 38-B was loading to a mixed fleet of practically every make of dump truck. There were four company-owned transports, including two Ford T-800 tandems with 10-yd. beds and two General Motors diesel-power units with 10-yd. semi-trailers. Four 8-yd. trucks also had been hired, including a Dodge, a Ford and two Chevrolets. The largest legal over-the-road load for even the large units was 12½ tons, which was hauled in all cases where a state highway had to be used. At the Bluffton and Steedman quarries, however, where no over-the-road hauling was done, this was increased to about 19½ tons per load. In all cases, the trucks hauled to a river point, where an earth ramp had been built out to a heavy pile-clump-supported timber gate, reminiscent of a ferry approach. This apron, which was

Talking over work progress are A. J. Armstrong (left), general superintendent of the dike driving operation, and P. L. Warren, an M-C dikeline ballast foreman.

Part of the work under the contract was extra pile driving by this floating rig, shown in position behind one of the dikes.

raised or lowered by means of a four-part block-equipped cable, permitted the trucks to cross over the earth ramp and down on the four barges which carried the rock out to the job.

340 Tons Per Trip

These four barges, all of steel construction, included two measuring 120 x 30 ft., which could haul approximately 340 tons of rock per trip, and two measuring 100 x 28 ft., which could move about 240 tons per trip. These barges preferably were loaded by using three of the units on an active basis, with one as a standby. Under this arrangement, two large barges and one of the smaller barges were active six days a week. While one of the barges was being loaded at the ramp, another was being unloaded at the dikelines and an empty barge was returning to be loaded. Tows from nine down to four miles one way had to be made by two towboats which serviced the job. There was one nine-mile tow upstream on which the largest twin-screw towboat was able to handle three barges, carrying approximately 1,000 tons of rock. This trip, however, took a long 3 hours 20 minutes. Generally, the basic plan of one barge at the ramp, one at the dike and another on the return trip was used.

Production in the quarry was averaging about 1,200 tons per day. If enough dikeline was available, however, quarry production was stepped up to as high as 2,200 tons in eight hours. According to Lewis Fisher, general superintendent of the quarrying portion of the work and a partner in Mid-Continent Stone & Construction Co., the reserve capacity built into power shovel and truck equipment was more than ample in case he ever had to step up his operations by as much as 35 or 40%.

Probably one of the most interesting and radical departures from contemporary river construction practice was the use of conventional tractor-mounted front-end loaders in taking the rock off the barges. While this method of unloading river barges is not exactly new, it did mark one of the first times that "high lifts" were used so extensively and to such good purpose. Many of the dikes, for example, consisted of structures which had been driven many years ago. It was necessary to bring the rock into the front side of the structure and reach over the pile fronts and stringers to deposit the rock on the inshore side. This was feasible with the high lift; it seemed that the machines had been designed exactly for that one purpose. Formerly, it was not unusual for a 30-man labor crew to take a half day to unload a barge. Modern tractor equipment unloads a barge with twice as many rocks, twice as big, and does the job in about 35 minutes. According to one official, J. R. Warren, who was in charge of dikeline work, an International TD-14A with a Hough front-end loader and an International TD-14 with a Drott skid loader can move about 1,800 tons in an 8-hour shift.

Bank Line Established

One of the unusual portions of the job, which is rather commonplace to Missouri River work of this type, was the construction of a special rock-filled trench on dry land at the site of a future Missouri River permanent bank line. Mid-Continent Stone & Construction Co. had three machines available for this purpose: a Bucyrus-Erie 54-B, a Northwest Model 95, and a P & H 655-A. The P & H had an 80-foot

L. E. Wehmeyer (left), pile driver inspector and a veteran on the Missouri River, and Gus Richards, pile driver engineer, look up from their work aboard floating rig.

boom; the Northwest 95, a 95-foot boom, and the 54-B an 85-foot boom. Because of a 19-ft. deep ditch, with commensurately high yardage per running foot, the machine with the longest boom was used—the Northwest 95. Carrying a 2½-yd. Hendrix bucket, this machine made the necessary excavation which carried down considerably below the water table. Half the excavated material was put on the river side of the ditch. The other half was put on the bank side to form a low rolled levee, which was dressed up after the ditch had been finished. Construction of dikes from the opposite shore eventually will cause the channel to cut gradually into the rock-filled location, where a permanent bank line will be established. Most of the bank lines up and down the river fortunately have been established as previously described.

Operations by the joint-venture contracting firm of Markham & Brown and Mississippi Valley Engineering & Construction Co. included the driving

Continued on page 58

Safety is stressed on job. Foreman Jimmy Fitzgerald wears a hard hat, life jacket.

Another load of dirt is released from the 12-yd. bucket of the Bucyrus-Monighan 6160, which moved 3 million yards on canal job.

Canal Gives Texas a New Seaport

by Ruel McDaniel

Kenyon Dredging Co. orders special barge built for Bucyrus-Monighan 6160 dragline, then digs flotation canal as it dredges entire seven miles of barge channel to a new chemical plant.

TEXAS has a new seaport with the recent opening of a seven-mile canal from San Antonio Bay to the loading terminal of the new Carbide and Carbon Chemicals Co. plant at Long Mott. This is the first leg of a barge canal to connect points in Calhoun and Victoria counties with the Intracoastal Waterway. San Antonio Bay leads into the Gulf of Mexico.

When the Kenyon Dredging Co., Inc., Port Allen, La., received the contract to dredge the canal, it immediately was confronted with two imposing problems:

1. The contract specified construction of an extra-wide levee. Kenyon had to provide a suitable working area from which to operate the digging equipment.

2. The soil to be moved varied widely, from practically bottomless marsh to hard flake.

Kenyon solved both these problems in one move. The firm mounted a Bucyrus-Monighan 6160 dragline on a specially-constructed steel barge and dug a 50-ft. flotation canal alongside the site of the main canal. Swinging a 165-ft. boom, the Bucyrus-Monighan dredged the entire seven miles from its mount in the flotation canal.

According to the contract, the canal was to be 100 feet wide at the bottom and 160 feet at the top, with a water depth of 12 feet. This was to require removal of about 3 million cubic yards of dirt, 500,000 more than was stipulated in the original contract.

The first phase of the canal work, involving 1,839,109 cubic yards of excavation, covered work starting at the Intracoastal Waterway and moving inland. This was strictly a "hydraulic job"—it was completely under water of varying depths. The Mc-

Williams Dredging Co., New Orleans, La., completed this portion of the work.

The Kenyon project began at the edge of the bay, skirted the water for more than three miles, then cut across coastal prairie land to the plant terminal. The contract price was $340,000.

"Our basic problem in planning for this job and providing the special equipment necessary for its completion," said Sidney Lewis, manager and job superintendent, "was the wide variance in ground conditions. Where we skirted the bay we were faced with basically a dredging problem in marsh lands, and as we drew away from the water the ground became increasingly more flaky and harder. So we were faced with a combination of dredging and excavating in the short distance of seven miles."

A 90-hp Cat D318 diesel and a three-drum Skagit hoist were used primarily for raising and lowering the spuds which hold the barge firmly in position for dredging work.

Barge Rig Essential

Because a barge-rig was essential for handling more than half the distance, company officials decided that it also would be feasible to excavate the remainder of the canal by the same method.

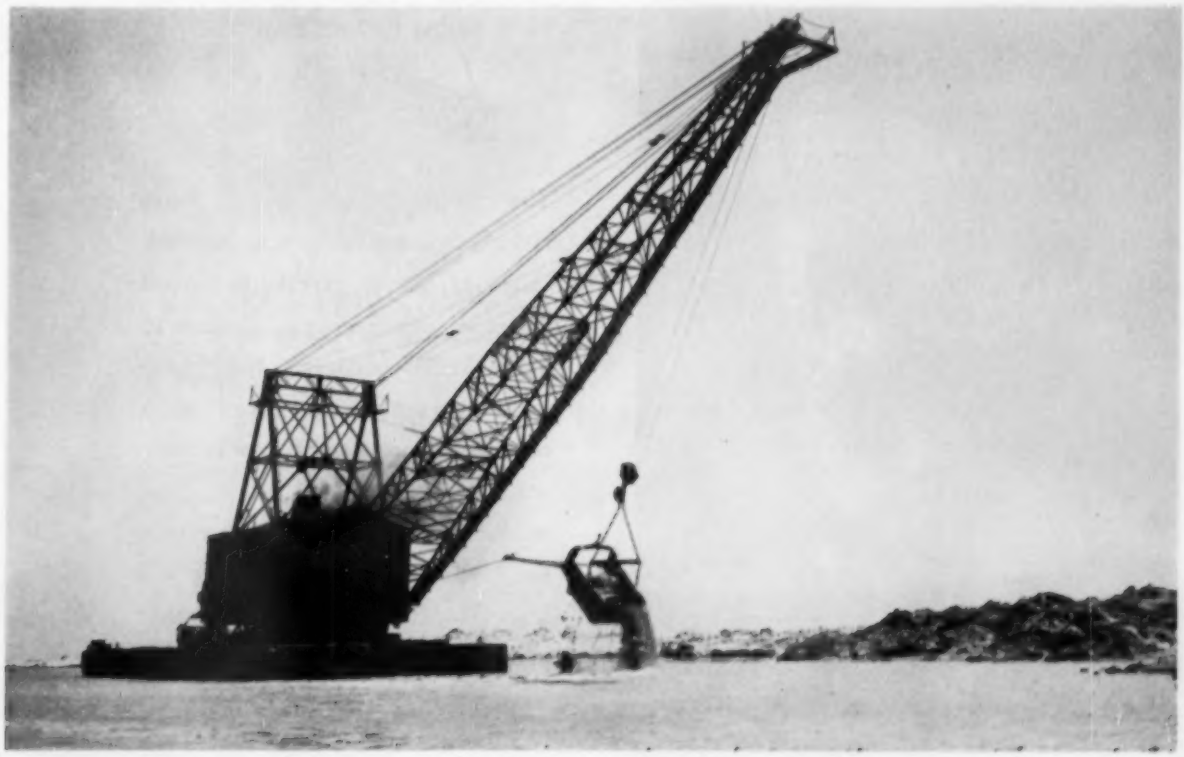
The flotation canal, in addition to providing space for the barge, solved the problem of moving equipment to the site. To move this equipment, however, meant extra earthmoving. The flotation canal was 4½-ft. deep.

Kenyon's engineering crew converted two small Oliver tractors into a version of the Marsh Buggies to provide them with maneuverability in the marshy terrain. This was accomplished by attaching wooden boards about 4 ft. long to the crawler tractors.

Other equipment used on the job by Kenyon included two Caterpillar D8 tractors and one FDE Oliver Cletrac.

Howard Kenyon, Jr., head of the

Continued on page 64



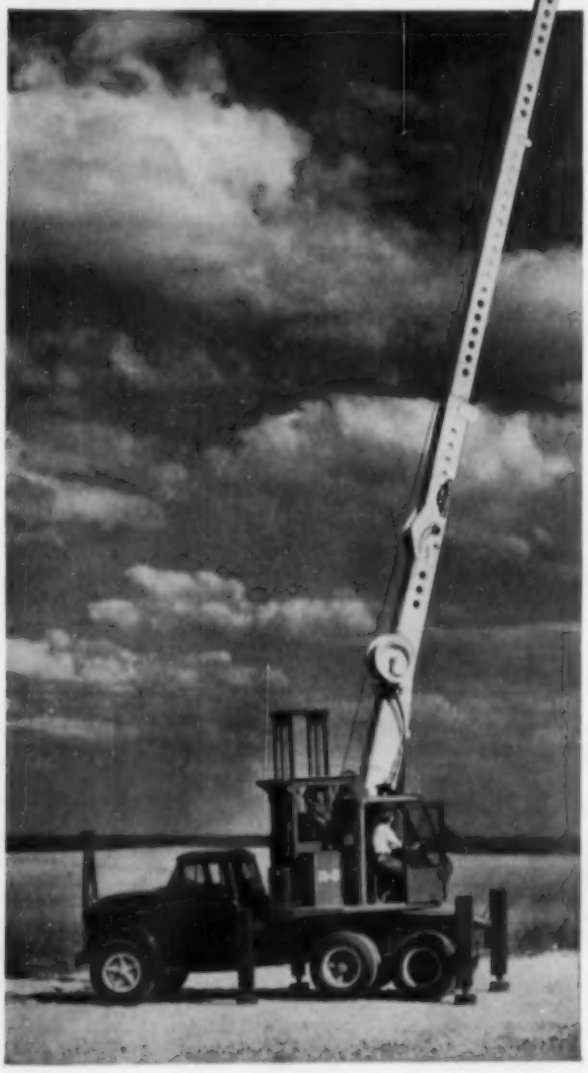
A 500-ton machine, Bucyrus-Monighan digs in chalky formation near the finish of the canal job. The machine swings a 165-ft. boom.

New H-5

1/2-Yd., 9-Ton Hydrocrane

★ ½-YD., 9-TON CAPACITY

★ 50-MPH TRAVEL SPEED



★ UP TO 240-FPM LINE SPEED

★ 24 TO 36-FT. STANDARD TELESCOPING BOOM

★ 38 TO 50-FT. HIGH-LIFT TELESCOPING BOOM

★ UNMATCHED PRECISION CONTROL OF LOADS

★ AVAILABLE WITH CLAMSHELL, CRANE HOOK, MAGNET, CAB

★ OPTIONAL REMOTE TRUCK CONTROL FROM CRANE CAB

The completely new, ½-yd., 9-ton H-5 Hydrocrane brings you the work ability of heavy, carrier-mounted cranes at small-crane cost. Because of its hydraulic outriggers this crane-excavator can be mounted on a commercial motor truck, new or used, without sacrificing any of its basic working ability. These outriggers give the Hydrocrane greater stability and lifting capacity than much heavier machines.

Bucyrus-Erie Company
South Milwaukee, Wisconsin

Gentlemen:
Send me your new H-5 Bulletin. This crane interests me for.....work.
(type of job)

★ *Name*.....
★ *Company*.....
★ *Title*.....
★ *Address*.....
★ *City*.....
★ *State*.....

110H55C

Mounts on Conventional Truck

50-Ft. Boom Telescopes to Half Length For Travel . . . . .

High-lift, 3-piece boom (extra equipment at added cost) gives you 50 feet of reach, retracts to 25 feet for traveling. When machine arrives at job site, boom and hydraulic fittings can be connected and machine working in less than 10 minutes.

Both the 2-piece standard boom and 3-piece erector's boom extend and retract 12 feet — hydraulically. You can change boom length *while you're working* — move a load in and out of buildings or close quarters without moving crane an inch.

All-Hydraulic Action Means Precision Control . . . .

Every crane function is fully hydraulic — boom and line hoist, swing, outrigger set and retract, boom telescope, bucket open and close. Control is so precise loads can be inched into place when necessary, yet line speed is up to 240 fpm.

The H-5 Hydrocrane's combination of 18,000 lb. maximum lift, 50-ft. boom plus 20-ft. jib, and 50-mph top travel speed opens greatly expanded job opportunities — particularly when all these features are packed into a unit that can meet highway laws for over-all length and axle loads (depending upon truck selection.)

1880-1955
BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin
75 Years of Service
to Men Who Shape the Earth

See It In Action
Find out what the new H-5 Hydrocrane can do for you. Ask your Bucyrus-Erie distributor about a demonstration.

News from the Field

Floodway Element Added

An important element in the Dallas (Tex.) floodway project is the exit of the Turtle Creek pressure sewer system which empties into the west fork of the Trinity River. Pressure is supplied by a dam and collecting basin 1½ miles above the exit structure.

Guarding against the possibility of a flooded Trinity River backing up against the sewer system are four Rodney Hunt cast iron, bronze-mounted sluice gates, 8 ft. wide and 10 ft. high.

The gates are closed only under emergency conditions or for periodic tests. They have a clear opening of 96 x 120 inches and were designed to withstand a head greater than 50 feet. The gates have wedges on top, bottom and sides. They are controlled by Rodney Hunt two-speed, worm gear floorstands having 40 to 1 and 160 to 1 reductions and solid stainless steel stems.

The United States Army Corps of Engineers, in co-operation with the Dallas Flood Control District, is building the structure as part of the $10,300,000 Dallas floodway project. Whittle Contracting Co., Dallas, is the contractor.

Engineering Fete Planned

Contributions of engineering to the United States will be given recognition when memorial rites are held at the century-old Wheeling (W. Va.) suspension bridge soon after planned repairs to the structure are completed.

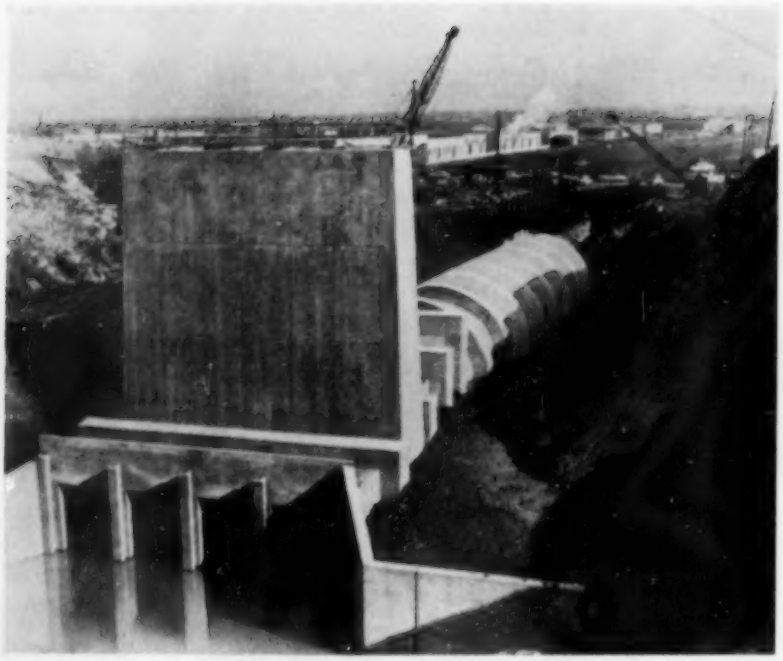
The rites also will honor John A. Roebling, the famous bridge builder who redesigned and built the Wheeling bridge in its present form. Roebling also built the Brooklyn bridge.

The memorial will be in the form of a large bronze tablet. It will be provided by John A. Roebling's Sons Corp., Trenton, N. J.

Initial plans for the occasion were made at Wheeling in July at a meeting attended by engineers representing the Wheeling chapter of the West Virginia Society of Professional Engineers and the counterpart of the organization in Ohio.

The governors of Ohio and West Virginia and the presidents of engineering societies of both states will be invited to the ceremony. The governor of Virginia and the president of the state's engineering society also will be invited. West Virginia was part of Virginia when the Wheeling bridge was constructed.

Other guests will include Dr. David B. Steinman, engineering authority and author of *The Builders of the Bridge*, and F. W. Roebling III, vice president-engineering of the Roebling Corp. and a great-great grandson of John A. Roebling.



This is the outlet of the Turtle Creek pressure sewer system at Dallas. Sluice gates can be closed to prevent river from backing into sewer system under flood conditions.

Pike Widened Fast

All records for concrete road construction in New Jersey were broken when the state highway department opened July 9 the extra 12-ft. lanes on the Garden State Parkway between U. S. Route 22 and the Raritan River. The widening operation had been urged by Gov. Robert B. Meyner to break jams caused by weekend traffic volumes of 60,000 cars per day.

Dwight R. G. Palmer, New Jersey highway commissioner, said that during the 32 working day construction period a total of 27 miles of concrete pavement was laid—13.5 miles in each direction.

An average of 5,080 feet of roadway was constructed each working day, compared to a normal 1,500-1,800 feet. The top day's work was 7,980 feet, Palmer said.

The highway department said that an analysis of the job revealed that it saved 2½ months on the job over normal operations because of round-the-clock work and employment of unique construction methods.

A central mixing plant was set up off the Parkway, where transit-mix trucks mixed the concrete for loading into 16 carriers for rush delivery to the job for placement. Engineers estimated that this method, instead of the conventional method of on-the-job mixing, speeded work by 20%.

Contractors for the job, the Villa Contracting Co. and the Weldon Contracting Co., received bonuses for completing the job two days ahead of schedule.

Ohio Turnpike Busy

Opened last Dec. 1, the 22-mile Eastgate section of the Ohio Turnpike had been used by 2,006,819 vehicles through July 22, the Ohio Turnpike Commission reported. The two-millionth vehicle was clocked earlier that day.

ALLIS-CHALMERS

Turn your earthmoving PROBLEMS into PROFITS!

Here's how M-R-S can help you solve three pressing problems...

High Machinery Prices . . . Rising Operating Costs . . . and Increasing Competition are three of the most pressing problems confronting the grading contractor today. M-R-S Tractors, equipped with exclusive M-R-S Weight Transfer, help you solve these problems by producing more dirt per dollar of machinery investment . . . more dirt per dollar of payroll . . . and more dirt per dollar of fuel, maintenance and overhead.

WEIGHT TRANSFER MAKES THE DIFFERENCE!

M-R-S Weight Transfer, coupled with the special M-R-S Four-Wheel Tractor design, means greater scraper capacity per horsepower . . . more dirt hauled per cycle . . . more yardage in place on the fill at the end of each shift.

The extra production advantages of M-R-S tractors combined with your good management can turn your earthmoving problems into profits!

Write, wire or phone today for complete details!

THE EMBLEM OF DEPENDABILITY

M-R-S MANUFACTURING COMPANY

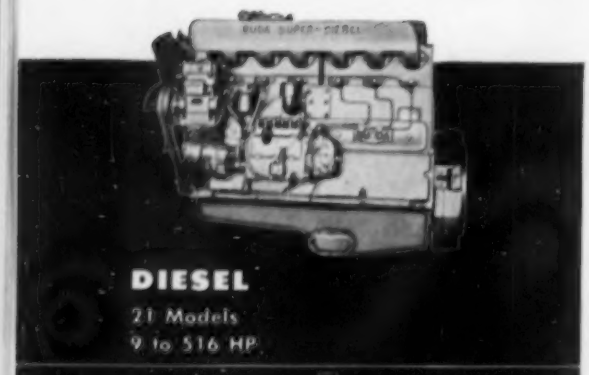
FLORA, MISSISSIPPI

POWER PAYS OFF

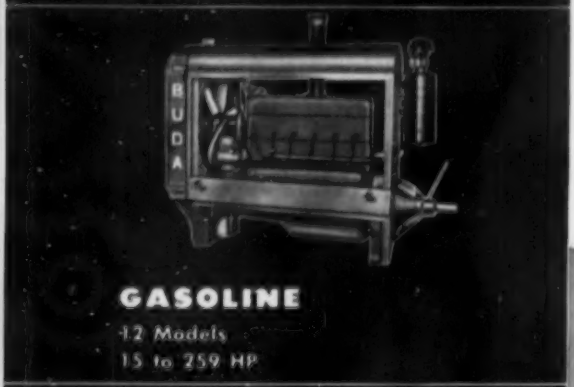
ALLIS-CHALMERS

in increased

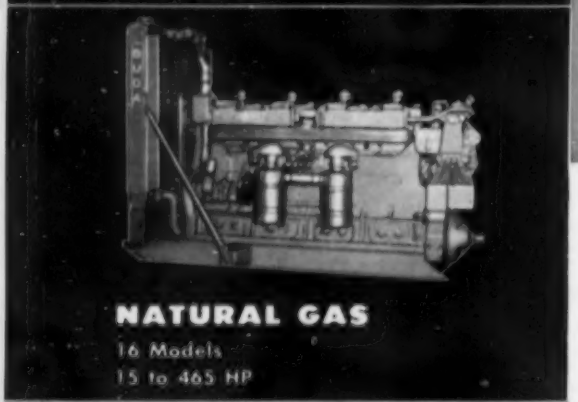
Specify or Install A-C



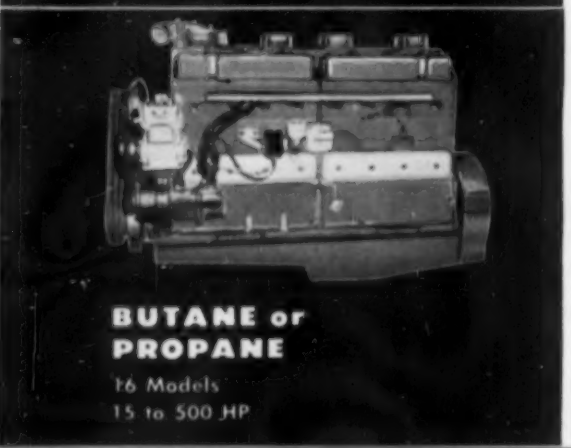
DIESEL
21 Models
9 to 516 HP



GASOLINE
12 Models
15 to 259 HP



NATURAL GAS
16 Models
15 to 465 HP



BUTANE or PROPANE
16 Models
15 to 500 HP

There are no "compromise" engines in the ALLIS-CHALMERS line. You can specify or install the *exact* type, size and fuel engine to fit any piece of construction equipment from a small pump to a giant dragline — and be sure you're getting the kind of power that pays off in more production and lower cost per horsepower hour of operation.

SHOVELS

Choose any of 65 basic models . . . 9 to 516 horsepower . . . select any type of fuel — Diesel, gasoline, natural gas, butane or propane — and you'll get a ruggedly built, workhorse that will run longer with less downtime and maintenance than any other engine.

ALLIS-CHALMERS power is *the* answer to today's demands for more power for more production, better performance and longer life.

Before you buy or specify any engine . . . GET THE ALLIS-CHALMERS POWER STORY! Your nearby ALLIS-CHALMERS Buda Division Distributor has facts and figures that will interest you. See him soon.

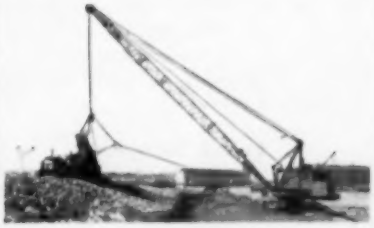
POWER PAYS OFF

production in any equipment

Diesel, Gasoline, Natural Gas, Butane or Propane Engines

for MORE WORK at LESS COST!

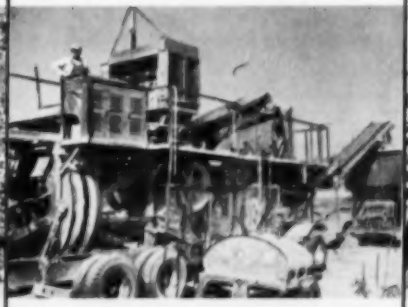
TRACTORS



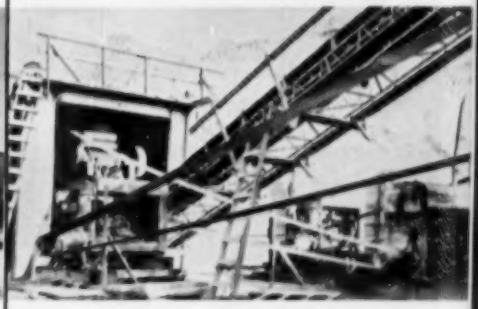
DRAGLINES

MOTOR SCRAPERS

HAULAGE UNITS

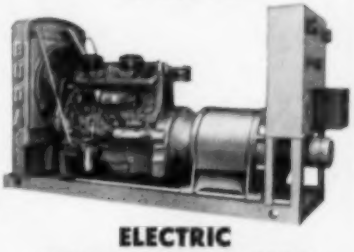


CRUSHERS



QUARRY EQUIPMENT

COMPRESSORS



ELECTRIC
GENERATING PLANTS

Write for more information on ALLIS-CHALMERS Power for construction equipment.

ALLIS-CHALMERS

BUDA DIVISION, HARVEY, ILLINOIS

Equipment You Ought to Know About

Light-Duty International

Manufacturer: International Harvester Co., Chicago, Ill.

Claims: The manufacturer has introduced a 4-wheel-drive, light-duty International truck which it says has power and traction to travel cross-country fully-loaded in mud, sand or snow.

The new model, the R-120 (4x4), has a gross vehicle weight rating of 7,000 lbs. It is offered in four wheelbases between 115 and 134 inches. Designed with a minimum body and step height, it is available with pickup, stake or flatbed body or as chassis and cab for special body.

The R-120 (4x4) can be operated on hard-surface roads as a conventional rear-wheel drive truck. The front axle drive is engaged by a shift lever.

The transfer case has a ratio of 1 to 1, or direct, and a 1.98 to 1 low range, providing, in combination with the standard three-speed transmission, six forward and two reverse speeds. With either of the two optional four-speed transmissions, eight forward and two reverse speeds are available.

Power take-off opening is available on the left side of the optional WT-9 transmission. Provision is being made in the transfer case design to supply a left-side mounted full-torque power take-off driving to either front or rear.

The R-120 (4x4) is powered by the 108-hp. International Silver Diamond 220 engine, with maximum torque of 179 to 1,600 rpm. The 131-hp. Silver Diamond 240, and new 11-in. clutch are optional. The standard clutch is 10 inches.

Standard tires are 6.50x16, with options including sizes through 7.50x15. Also available are 9.00x16 eight-ply single front and rear tires for added flotation. A 7.00x18 tire for front and rear also is available where high road clearance is required.

A wide selection of wheelbases and bodies is available. Wheelbases are 115-in., 122-in., 127-in. and 134-in. The 6½-ft. and 9-ft. pickup bodies are available as optional equipment.

Also available is a front mounted winch.

Euclid Scrapers

Manufacturer: Euclid Div., General Motors Corp., Cleveland, Ohio.

Claims: Two overhung engine-type scrapers, each with a struck capacity of 18 cubic yards, are being produced by Euclid. Each utilizes Allison Torqmatic Drive, consisting of torque converters and semi-automatic transmission.

The Torqmatic Drive eliminates clutching and permits the operator to change from one speed range to another under full power. It provides a constant flow of power to the drive wheels and automatically provides the power needed for varying conditions of loading, hauling, and dumping. Both scrapers have No-Spin differentials to provide maximum traction by directing full torque to the drive wheel with the best footing.

The Model S-18 is powered by a 300-hp engine and has 27.00x33 tires. The twin-power Model TS-18 (shown) has two 194-hp engines—one driving the tractor wheels and the other providing power to the rear wheels. Full 90° steer permits both models to make 180° turns in 35 feet or less.

With 4-wheel drive and a total of 388 horsepower, the TS-18 has the power and traction required for self loading in practically any material and for fast travel speeds on steep grades and difficult hauls, says Euclid.

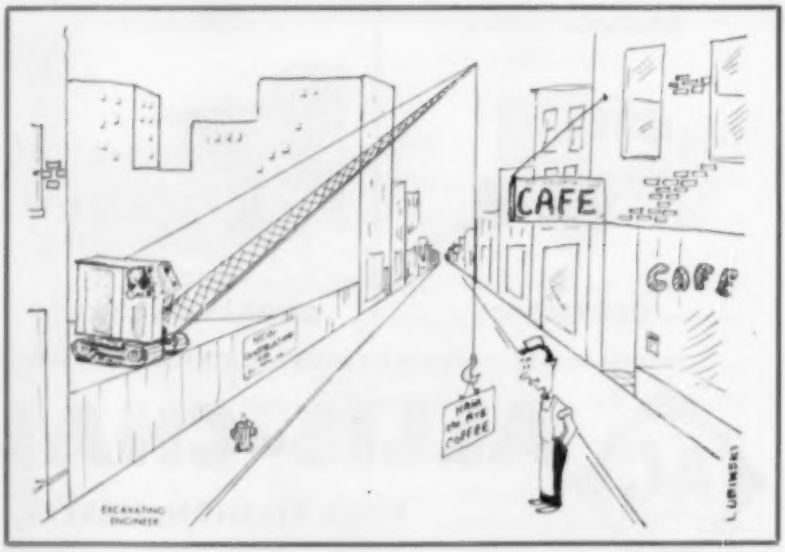
All operations of bowl lift, apron and ejector on the scrapers are independently controlled by means of hydraulic lever action.

Paving Breaker Handle

Manufacturer: Ingersoll-Rand Co., New York, N. Y.

Claims: The manufacturer has developed a safety handle for paving breakers. The handle was devised, says I-R,

Continued on page 54



Let's look at why

Quarries Use More Bucyrus-Erie Excavators Than Any Other!

Big Output is the first important characteristic that quarry owners like about Bucyrus-Erie shovels. Balanced design and fast, sure control help operators achieve high-speed work cycles. The modern front end has plenty of strength to withstand tough digging stresses, yet deadweight is avoided so that more power works swinging payloads.

Dependability is a "must" for profitable quarry operation and Bucyrus-Erie Individual Design helps assure the desired reliability. Every part is matched to the rated capacity of the machine and there is correct balance between power, weight and speed for efficient digging.

Low Maintenance is important, too. Bucyrus-Eries have few wearing parts, no complicated "gadget mechanisms" to cause trouble. A positive lubrication system and the liberal use of anti-friction bearings smooths the flow of power to work, with minimum wear on moving parts.

Follow the lead of other quarries and let Bucyrus-Erie shovels work for you. Your Bucyrus-Erie distributor will be glad to furnish complete information on shovels from ⅜- to 4-cu. yd. capacity. For information on heavy-duty, electric quarry machines with capacities from 2½- to 8-cu. yds., write direct.

176E55C

BUCYRUS ERIE

South Milwaukee
Wisconsin

1880 75 1955
YEARS OF SERVICE
to Men Who
Shape the Earth

New Equipment . . .

Continued from page 52

following receipt of field requests noting a need for such a device on tools used in connection with demolition work where operators were injuring their hands when working close to walls or projecting masonary.

The new device weighs less than two pounds and is available on the new Ingersoll-Rand PB8A paving breaker. It also can be purchased separately for attaching to existing PB8A models or earlier PB8s.

Oil-Clutch Road Grader

Manufacturer: Caterpillar Tractor Co., Peoria, Ill.

Claims: Caterpillar has introduced as standard equipment in its No. 12 motor grader the oil clutch which is used in the manufacturer's track-type tractors.

In principle, the oil clutch in the No. 12 grader works as follows: A separate pump, incorporated with the engine oil pump, supplies crankcase oil to the clutch. When the clutch is disengaged, oil surrounds the clutch discs, cooling the facings. The two driven discs on the No. 12 have special resilient organic material facings bonded to them in which are a network of grooves to permit the oil to escape during engagement.

The free circulating oil quickly dissipates the heat generated through the friction of engaging and disengaging the clutch. It also acts as a lubricant for all moving parts, including the pilot and throwout bearings. As the clutch discs move to the engaged position, the facings are "oil protected." Once the clutch has been engaged, the friction surfaces are rendered completely free of oil because of the pressure between the plates.

Field tests, says Caterpillar, show that the clutch facings undergo very little wear—1,000 hours of operation wear averaged .0025 inches. The clutch facings are 1/16 in. thick.

B-E H-5 Hydrocrane

Manufacturer: Bucyrus-Erie Co., South Milwaukee, Wis.

Claims: Its all-hydraulic H-5 Hydrocrane can handle jobs formerly considered impossible for a light, high-speed truck crane, B-E claims. The H-5 is the newest unit in the manufacturer's Hydrocrane line.

Highly maneuverable and mobile, the H-5 can be used for high lift, close quarter erection, heavy bucket or crane work, big lift, indoor jobs and precision materials handling assignments.

According to the manufacturer, the H-5 is completely new from outrigger feet to boom tip. It is available as a ½-cu. yd. excavator and as a 9-ton lifting crane. It is designed for mounting on a customer's new or used conventional motor truck, eliminating need for a crane carrier. A significant feature of the H-5 is its capability, depending on truck selection, to conform with state highway restrictions regulating width, height and axle load limits.

The H-5 has an 18,000-lb. maximum lift. It can be equipped with a standard 2-piece boom (telescoping in length

from 24 to 36 feet) or with an optional high-lift, 3-piece boom (extendible in length from 38 to 50 feet). Mounted on a truck with its boom resting over the truck cab, the Hydrocrane moves quickly through city traffic and can travel at speeds up to 50 mph along the open highway. The comparatively short tail swing is advantageous for close-quarter work.

The H-5 offers such additional features as precision hydraulic control; four patented outriggers which provide more stability, greater leverage without counterweight and instant leveling; gooseneck construction at the boom point; welded steel boom; alloy steel revolving frame; simple deck machinery; self-power unit and fingertip controls. A remote control unit to operate the truck from the crane cab is available as extra equipment.

Safety features include an automatic

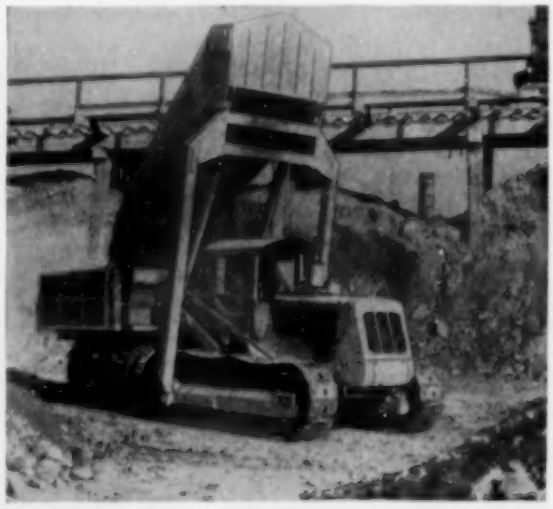
Austin Overshot Loaders double production...cut costs!

The Austin Overshot Loader dozes into its load — raises it overhead — then dumps it into the haulage unit in a fast *straight line* cycle. Austins save time on every load . . . boost production . . . reduce operator fatigue because they eliminate time-consuming swinging or turning of the tractor. Complete loading cycle requires only 20 seconds.

Austin Overshot Loaders are available for mounting on Caterpillar D2, D4, D6, D7, and D8 Tractors. Bucket capacities range from 1 to 4 cubic yards. A.X.-1307

Austin Overshot Loaders are sold by Caterpillar-Austin Dealers everywhere.

1. LOADS
2. RAISES
3. DUMPS



AUSTIN DIVISION

Central Ohio Steel Products Company Galion, Ohio • Denver, Colorado

internal lock to prevent outriggers from drifting down during travel; automatic relief valves for controlled stopping without "bounce-back"; a safety valve in the hoist circuit to prevent shock from abrupt stops, and an indicator in the operator's cab to check the load against weight limits on the capacity plate.

With every function of the H-5 fully hydraulic, loads can be moved a fraction of an inch at a time. Two selector valves —one for each valve bank—can be used at the operator's convenience to increase line speeds.

The gooseneck boom tip provides the same effect as an open-throat boom. It improves load clearance and load stability, preventing cable fouling under the boom and spinning of loads. A quick-connect jib, available for either the standard or high-lift boom, provides a maximum clear lift under the hook of 72½ feet at minimum radius.

The H-5 is self-powered. It is equipped with a 75-hp Ford power plant mounted on the upper deck.

Attachments include a low headroom type, dual-ram, ½-cu. yd. clamshell bucket and a 39-in. dia. lifting magnet powered by a 5-kw generator driven from the Hydrocrane's deck-mounted power plant.

Wire Rope Electric Hoist

Manufacturer: Harnischfeger Corp., Milwaukee, Wis.

Claims: Four capacities—250, 500, 1,000 and 2,000 pounds—are available in P & H's Zip-Lift wire rope-electric hoist.

One of the hoist features, according to the manufacturer, is two brakes—motor and load, either of which will hold the full load. A full 10 ft. lift is standard, with 14, 18 and 20 ft. lifts as optional equipment.

P & H says that it builds the motor for the unit specifically for hoisting service, with high starting torque and frequent reversing characteristics. The unit has a positive-acting upper-limit switch.

Rubber-Tired Dozer

Manufacturer: Clark Equipment Co., Construction Machinery Div., Benton Harbor, Mich.

Claims: A rubber-tired dozer, powered by a turbo-charged diesel engine, has been introduced by the manufacturer. It is the Model 180 Turbo-Dozer.

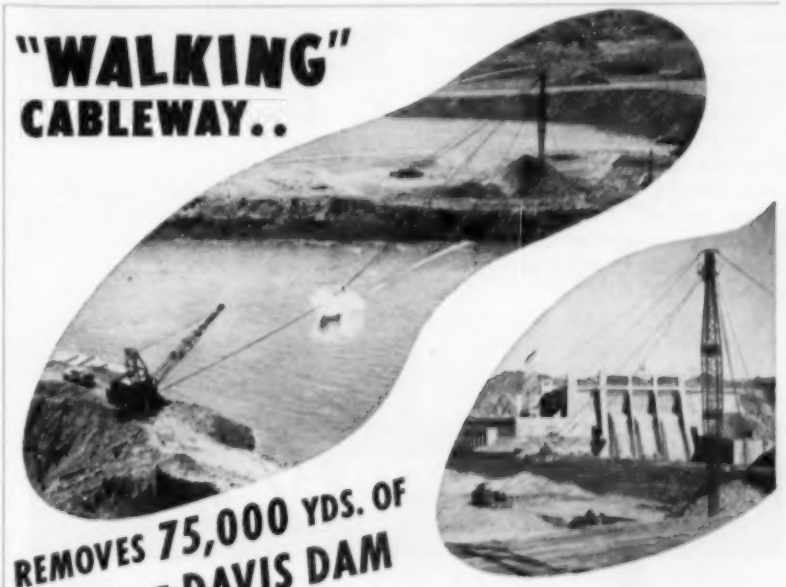
It has a 165-hp. rating and a capacity of 2¾ yards. It has a road speed of 27 mph and has four-wheel drive and rear-wheel steering.

Among the 180's operational advantages, according to Clark, are hydraulic controls, a bowl which can be tilted by the operator while the machine is in motion and the ability to move over highways under its own power. The Turbo-Dozer has a power-shift transmission, a heavy-duty torque converter and planetary wheel drive axles.

The 2¾ yd. bowl, raised and lowered by two double-acting cylinders, is tipped back and forth by a 6-in. double-acting hydraulic cylinder. Both ends of the

blade are fitted with vertical cutting edges which enable the Turbo-Dozer

Continued on page 56



To deepen the Colorado River from Davis Dam to 2,000 ft. downstream, Grafe-Callahan Construction Co. employed a Sauerman Slackline Cableway in this unusual arrangement:

Mast and hoist of the 2-cu. yd. machine were mounted on wooden mats. Only four "steps" were required in covering the 2,000-ft. distance as the excavation progressed. Maximum span was 600 ft. A crawler crane, running on a 30-ft. cofferdam on the opposite bank, served as tail anchor.

Total excavation was 75,000 yds. of rock. Excavation depth ranged from 10 to 15 ft. to provide the 20-ft. channel depth to lower tailwater at the power plant for maximum effective head on turbines.

Sauerman Slackline Cableways—⅓ to 3½ cu. yds. in size—span water, bogs or pits to distances up to 1,000 ft. On the ordinary or the unusual job, this Sauerman equipment is unexcelled for deep digging or handling rock, sand, clay, peat and ore.

Experienced Sauerman Engineers can solve your excavating problems. Write today. Request Catalog C, "Slackline Cableways," and also pertinent field reports.

SAUERMAN BROS. INC.

622 S. 28th AVE., BELLWOOD, ILL.

New Equipment . . .

Continued from page 55

to slice through heavy roots preparatory to knocking over trees. Side cutting edges of the dozer bowl are replaceable. End bits are interchangeable.

A locking differential in the front axle automatically applies power to the wheel with the firmest footing when one wheel begins to slip. The steering drive axle oscillates to maintain ground contact of all wheels on uneven terrain.

Final planetary reductions in the wheels reduce the torque load on axle shafts by 70%, says Clark. Final reduction is as close as possible to the point where tractive effort is applied.

Starting is facilitated by a 24-volt electrical system.

The Turbo-Dozer has four 18.00x25, 12-ply high flotation tires and a wheel tread of 6 feet 11 inches. It has vacuum power-boosted four-wheel brakes for service use and two-wheel mechanical brakes, connected to service brake shoes in the front wheels, for parking. It has a 50-gal. fuel tank.

A swinging drawbar is fastened to the center of the 180's "C" frame.

The Turbo-Dozer is 8 ft. 4¼ in. high over the air cleaner cap, 9 ft. 9 in. wide at the bowl and 17 ft. 1 in. long with the bowl vertical on the ground. It has a 7 ft. 4 in. wheelbase and a 14½ in. ground clearance. Its weight is 27,000 lbs.

Pippin I-H Attachments

Manufacturer: Pippin Construction Equipment, Inc., White River Junction, Vt.

Claims: The manufacturer has introduced the Pippin Excavator and Pippin Angling Bulldozer for mounting on the International 300 utility tractor.

The excavator digs to a depth of over 10 feet and loads truck to a height of nine feet with back hoe bucket and 12 feet with shovel bucket. The mounting incorporates strong sub-frame running the entire length of the tractor. The front drive pump can be used for operation of both the excavator and front end attachments.

The angling bulldozer features tubular push arm construction and a low pivot point. The blade is available with angling bracket for quick angling 12½ or 25° left or right.

Speedall Tractor Shovels

Manufacturer: Pettibone Mulliken Corp., Chicago, Ill.

Claims: The manufacturer has announced a "super" Speedall line of tractor-shovels. Among features of the line are: extra heavy-duty power train, including power-shift transmission; torque converter, and four-wheel drive planetary axles.

The line, which supplements Pettibone's standard four-wheel drive Speedall units with torque converter, includes 2½, 1¾ and 1¼-yd. units.

The power-shift transmission is encased in steel, is designed with ball bearings throughout and has high-pressure forced lubrication.

The clutch pedal has been eliminated. Two levers on the steering column hydraulically shift the tractor-shovel four speeds forward or four speeds reverse.

The bucket is designed for a 30° tilt-up from ground position. An automatic device levels the bucket.

Each model is offered with either a gasoline or diesel engine, including General Motors diesel with Allison torque converter. All models have power steering and four-wheel Hydrovac booster brakes. Numerous accessories are available, including a snow bucket, lift fork, crane hook, V and one-way snow plow and a bulldozer blade.

Movall Rock Guards

Manufacturer: C & D Mfg. Co., Perkins, Calif.

Claims: The manufacturer has made available rock guards as an accessory for all models of Movall Wagons, either

DOWN GO FIELD EXPENSES!

Expenses are cut to the bone when you have Omaha Dragline Buckets on the job. Forty-five years of experience and improvement produce Omaha buckets built to last in the field. These buckets are reinforced at points of strain to stand up under the toughest jobs. Time and dollar consuming field repairs are reduced. Write now for complete catalog giving specifications of 4 available types.

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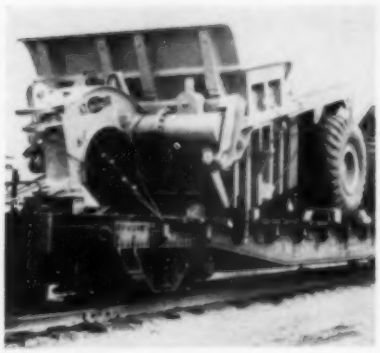
DRAKE-WILLIAMS MOUNT • OMAHA, NEBR.



as original equipment or for field installation. For easy removal, if desired, the rock guard is installed by bolting to vertical box beams which are welded to the cable-powered ejector.

Finegrader Curve Feature

Manufacturer: Gar Wood Industries, Inc., Wayne, Mich.

Claims: The manufacture of Gar Wood-Buckeye Power Finegraders with a Grade-A-Curve feature has been announced. The new feature, says Gar Wood, makes the fine grading of highway curve transitions a continuous operation, with grade to exact specifications.

Finegraders with the Grade-A-Curve feature have an I-beam structural frame. The frame is hinged at the center of the machine, so that an accurate, ratchet-type control adjustment with graduated steps raises the frame and cutting blades at the center for cutting a crown and lowers them to cut on the level without stopping the machine for adjustments.

Galion Trailer Dump

Manufacturer: Galion Allsteel Body Co., Galion Ohio.

Claims: Galion has announced a single axle trailer dump, the Model SSM Transporter, designed for operation with single rear axle tractors. The SSM, according to Galion, is especially suited for materials handling use in localities where weight laws allow high individual axle weight limits combined with relatively low gross weight.

The SSM Transporters are available in body lengths from 16 to 20 feet and with payload capacities of 10 to 20 cubic yards. The Transporters are equipped with rear mounted Model 77142 Duo-ram hoists with 18-ton capacity.

Used throughout the body is 10-gauge high resistance steel. Closely spaced 4 in. channel crossmembers are welded to 6 in. I-beam longitudinals. The fabricated steel chassis is fitted with Stabl-ride or semi-elliptic leaf spring suspension. A full selection of brake types, axle capacities, tires and optional equipment is offered.

Front Loading Trailer

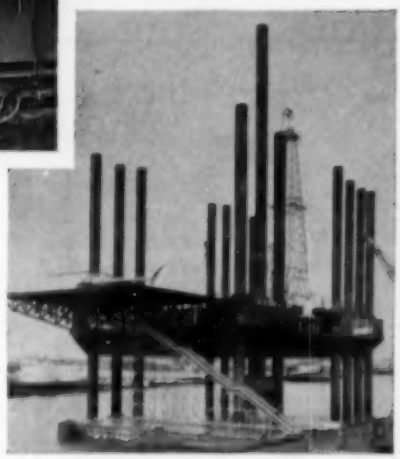
Manufacturer: LaCrosse Trailer Corp., LaCrosse, Wis.

Claims: A front-loading low-bed trailer, designed to facilitate transpor-

Continued on page 58

How **WESTINGHOUSE PNEUMATICS**

Solved a difficult control problem



On this Mobile Drilling Platform, built for the Offshore Company, a Westinghouse Air Brake Company pneumatic system controls the operation of DeLong air jacks which raise or lower the platform.

With this control system, the jacks are operated together from a master control station, or individually to suit the underwater conditions encountered.

Westinghouse pneumatic controls are used because they give this selectivity, and because they are simpler, lighter and easily serviced.

If you are designing new equipment, or are re-building older equipment, let us show you how Westinghouse pneumatic controls can simplify the job. Just send the coupon.

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Westinghouse Air Brake
COMPANY

INDUSTRIAL PRODUCTS DIVISION WILMERDING, PENNSYLVANIA

New Equipment . . .

Continued from page 57

tation of black top pavers and rollers, among other things, has been announced by the manufacturer.

Employing a self-contained power system with a special sheave-type hitch and simple cable lift arrangement, the Model LXP-14 can be operated behind any standard truck, regardless of whether the truck has a hoist, says LaCrosse. A motor-driven hydraulic pump and ram located underneath the trailer bed, actuates the cable which lowers the trailer platform to a 7 in. height for loading or unloading over the front end. During this operation, the hoist cable is detached from a dead-end hitch on the rear of the truck and the swivel hitch on the trailer is turned so that it lies flat on the ground. Energy for the electric motor is supplied by battery from the towing truck.

The trailer is available in two models of 8 and 14-ton capacity. The 8-ton unit has an 8x13 ft. load surface, with four 7.50x15 12-ply tires. It weighs approximately 3,600 lbs.. The 14-ton model has an 8x16 ft. deck, carries four 10.00x15 14-ply tires and weighs about 5,500 lbs.

Adjustable Loading

Manufacturer: E-Z Loader, Inc., Cleveland, Ohio.

Claims: The manufacturer has announced the E-Z Loader Trailer, which raises or lowers flush with the ground—like an elevator—for the loading or unloading of equipment and materials.

With the trailer bed lowered flush and parallel with the ground, vehicles may be driven onto or off it under their own power.

The trailer bed is raised and lowered by a hydraulically-operated mechanism which is controlled manually by the actuation of a pump handle mounted on the trailer or by a switch inside the towing passenger car or truck.

Several models are available, in both single and tandem axles, with capacities of from 5,000 to 20,000 pounds. All standard models have a welded-steel body, are 6 ft. wide and range from 10 to 14 ft. in length.

Albert E. Cummings

Albert Edward Cummings, 61, director of research and a director of the Raymond Concrete Pile Co., New York City, died July 20 in New York. He was stricken with a cerebral hemorrhage at his office July 8. Mr. Cummings resided in New York at 130 E. 75th st.

Mr. Cummings was born in St. Louis, Mo. He was graduated from the University of Wisconsin in 1915 with a Bachelor of Science in Civil Engineering. In 1922, on the basis of his experience with the Raymond Co. and a thesis on composite piles, the University of Wisconsin conferred upon him the professional degree of Civil Engineer.

He is survived by his widow, the former Mabel M. Marshall, whom he married July 7, 1917, and a brother, R. H. Cummings, Dallas, Tex.

Mr. Cummings joined the Raymond Co. in March, 1916 as a field clerk. Later he served as a field superintendent for four years. Then, for 23 years, he was district manager at Chicago. He was appointed in 1944 as director of research with headquarters in New York. He was elected a company director in 1947.

From the time soil mechanics was introduced to the engineering profession more than 30 years ago, Mr. Cummings took an active part in its development and its practical application to foundation work. He visited soil mechanics laboratories in many parts of the world.

He was author of about 30 papers and discussions on subjects relating to soil mechanics and foundation engineering. Since 1940 he was lecturer of foundation engineering at the Harvard University Graduate School of Engineering and the University of Illinois College of Engineering. In 1953 he was named special lecturer in the School of Civil Engineering of Cornell University.

He was a member of the International executive committee of the International Society of Soil Mechanics and Foundation Engineering. He was chairman of the United States National Council on Soil Mechanics and Foundation Engineering.

Big Muddy . . .

Continued from page 43

of piling by a floating pile driver mounted on a fabricated steel pontoon hull. This pile driver was equipped with a 50-ft. set of leads, a Vulcan No. 2 hammer and three-drum steam-driven hoist. The basic power plant for the driver consisted of an 80-hp oil-burning upright boiler, whose function was to power the steam hammer, the steam hoist and various winches which moved the plant. This driver, operating one shift a day, usually accounted for from 30 to 35 units driven in the typical fine line which veteran Missouri River men like Jimmie Fitzgerald, pile driver foreman, have established as their trademarks.

The pile driving was designed not so much in the nature of new construction, but to beef up existing dikes and give them extra strength. In some cases where floating winter ice had cut loose the end of dikes, extensions had to be driven. All work under the contract, however, could be classed as maintenance or betterment construction.

Personnel

Design and supervision of the job was under the Kansas City district office of the Corps of Engineers, headed by Col. E. C. Adams, District Engineer. Col. Adams' traveling representative was John Schaub. Howard Dysart was chief inspector.

The contractor's operations were under the general supervision of Ralph E. Brown, a partner in Markham & Brown. Paul Seavy represented Mississippi Valley Engineering & Construction Co., and A. J. Armstrong was general superintendent of the dike driving operation. Stone production work was under the direct supervision of one of the partners of Mid-Continent Stone & Construction Co., Lewis Fisher.

New Lease on Life

Completion of the job will give the 60-mile stretch of Missouri River between Steedman and Washington a new lease on life. That was its entire purpose. By strengthening the old dikes, extending a few and driving extra piling where gaps had appeared, this construction outfit of only 32 men demonstrated what modern ingenuity and good equipment could do when brought to bear on almost any type of construction job—land or water.

Here's why Bucyrus-Erie Dragshovels Save Trenching Time and Costs

YOU'RE OFF TO THE RIGHT START with a digging stroke that is steady and not too fast so that operator can heap the dipper high. Power is concentrated at the dipper teeth for best penetration of even toughest material.

FOLLOW-THROUGH, with really high-speed hoist and swing, gets dipper out of the trench and into dumping position with no waste of time or operator effort. Hoist and swing action are so smooth that very little load is spilled.

FINISHING THE CYCLE, the dump is clean and trigger-fast. The dipper's high arch, smooth sides and rounded heel are designed for easy digging and dumping.

When you combine that kind of digging efficiency with sound design that keeps maintenance costs way down, you have the answer to low-cost trenching. See your Bucyrus-Erie distributor soon for complete details. 175E55C

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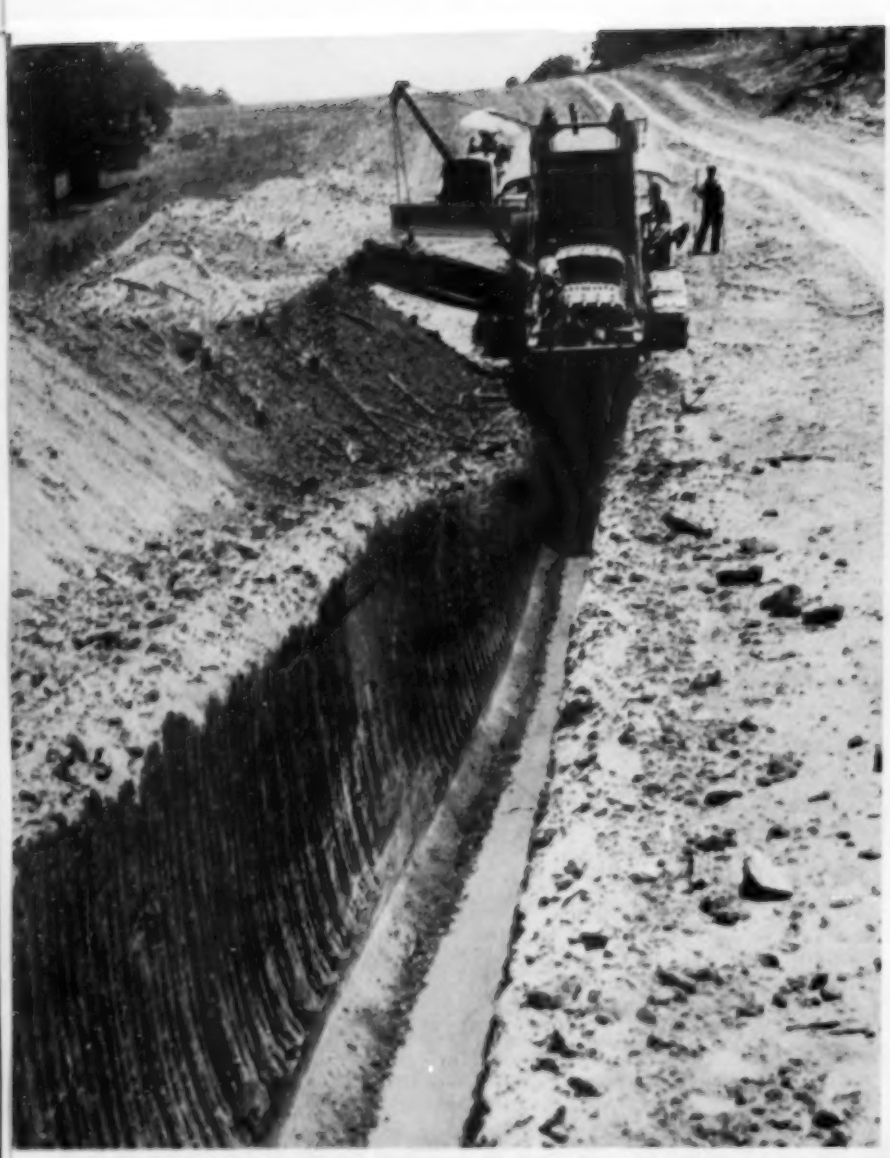
Shape the Earth



Buckeye Model 51 trencher (above) and Cleveland Model 320 were used on Panama-Williams' spread in North Carolina. Ditchers kept well ahead of the pipe layers.

Pipeline . . .

Continued from page 33

N. C., the other from Dallas, N. C., to the vicinity of Davidson, N. C. Operations out of the Stanley (N. C.) field office in June were in charge of Field Superintendent W. H. (Cooney) Shiflett.

Two river crossings were included in the Panama-Williams contract. One was the Catawba, east of Davidson, and the other in the South Yadkin, west of Lexington.

Most of the excavation on the section was in clay, except at the bottom of some of the hollows where some rock was found. Ditching was done by two trenchers, a Buckeye model 51 and a Cleveland model 320. Depth varied from 66 to 90 inches. From 1,500 to 2,500 linear feet was dug each day by each machine.

The trenching machines worked from five to eight miles ahead of the pipe laying crews. They were followed by three Bucyrus-Erie 22-Bs. One was a dragshovel with an Amsco dipper and the other two swung Owen ¾-yd. clamshell buckets on 45-ft. booms. These machines handled the cleaning out of road crossings and hollows.

Pipe laying crews worked in two gangs. Each group had four Allis-Chalmers sideboom pipe-laying rigs. The first crew laid most of the line. The other crew did all of the special settings. Laying crews were followed closely by a Cleveland back-filling rig.

The J. O. (Red) Wilson Trucking Co., Monroe, La., had the pipe stringing contract. Lloyd Evans was assistant superintendent under "Cooney" Shiflett. H. C. (Hank) Sherrer was office manager.

Trenching out road crossings and hollows were jobs for this 22-B dragshovel.

Virginia

A spread of 72.06 miles of 30-in. pipe in Virginia was being handled by the Williams Brothers Co., of Tulsa, Okla. Through late June, the firm had installed about 39 miles of pipe.

T. E. (Thelma) Davis was superin-

Associated barge, especially built for river crossings, carries I-R compressor.

Panama-Williams' pipe-laying crews worked in two gangs. Each gang used four Allis-Chalmers sideboom tractors, as shown here. One crew specialized in road crossings.

tendent of the spread. Paul Mackie was office manager and A. T. Austin was timekeeper. Hal Lytle was handling the stringing. John Noels was chief inspector and R. V. Jones the welding inspector for Transco.

Virginia-Maryland

Two major river crossings were included in this year's loop line construction schedule. One was on the Potomac River near Rockville, Md. The other was on the Savannah River between Georgia and South Carolina.

Associated Pipe Line Contractors, Inc., had the multiple river crossing job on the Potomac. This was part of the Associated contract at the northeastern extremity of present loop line work. The contract calls for 80 miles of 30-in. pipe, 18 miles in Virginia and 62 in Maryland.

To prepare the river crossing, a unique drilling barge was designed by Paul Robishaw and built by Associated. Because the river bed at the cross-over point was solid rock and 2,800 ft. wide, considerable drilling was required. Heavy rains, however, had raised the river and drilling was being held up while waiting for the flow to subside.

The pipe was specially prepared with a concrete coating to give it the necessary weight. The ordinary 158-lb. per foot weight was increased to 500-lbs. per foot by this method. Plans were to

Continued on page 64

Included in the northernmost section, being done by Associated Pipeline Contractors, Inc., was the crossing of the Potomac River near Rockville, Md. This is a general view.

NOT in the Contract

A Texas construction worker on a job in Montana in bitter cold weather climbed off his rig in the middle of a shift.

"Hey," yelled the foreman, "where are you going?"

"To get my safety hat," was the reply.

"Okay, where is it?"

"In Texas."

Cannibal Chief (to victim): "What did you do for a living?"

Victim: "I was an associate editor."

Chief: "Cheer up. After tonight you'll be editor-in-chief."

A golfer went to hell and asked to play golf.

He was shown a 36-hole course, perfect in all physical respects. The Devil gave the golfer a perfectly balanced set of clubs, clubs the golfer felt that he had been swinging all his life.

They went out to the first tee. "What a course!" shouted the golfer. "Give me the ball."

"Sorry, we have no balls," answered the Devil. "That's the hell of it."

The old man went into a drug store and ordered a box of pills. "Here you are, sir," said the clerk as he handed him the pills and his change.

"You're sure these laxative pills are good?" asked the old man.

"Sir," replied the indignant clerk. "If you'll notice I have taken the liberty of giving you your change in nickels."

Customer: "Have you a book called, 'Man, the Master of Women'?"

Salesgirl: "Fiction counter to your left, sir."

"Mind if I play through?"

George was busily engaged with a spade in the muck beside his car when a stranger hailed him.

"Stuck in the mud?" asked the stranger.

"Oh, no," exclaimed George, cheerily, "my engine just died and I'm digging a grave for it."

Uncle Mose was expostulating about his religion to the folks on Catfish Creek. "I know I ain't been what I oughta been. I has stole chickens, stole a lot of watermelons, told whoppin' lies, got drunk lots, cut about with my razor, shot lots of craps, cussed awful, but I sure am thankful there's one thing I ain't never done."

"What is it, Uncle Mose?" asked a listener.

"In the midst of all my meanness," replied Uncle Mose, "I never lost my religion, no siree."

A young husband, wrapped in the greatest excitement, ran to the telegraph office and wired his wife's relatives the following information.

"Triplets today, more tomorrow!"

Foreman (to applicant with a slight physique): "Do you think you are fit for really hard labor?"

Applicant: "Well, some of the best judges in the country have thought so!"

A recession is a period when you tighten your belt. A depression is a period when you have no belt to tighten. And when you have no pants to hold up—that's a panic.

"Which would you rather give up—wine or women?"

"It depends on the vintage."

Men are peculiar, just as women have long suspected. For instance, a shovel operator who hadn't kissed his wife in five years shot a fellow who did.

"Say, I hear you lost your job. Did the foreman fire you?"

"Well, you know what a foreman is—he's the guy that stands around and watches the other fellows work."

"What's that got to do with it?"

"Why, he got jealous of me. People thought I was foreman."

"Do you mean that they don't hang men with wooden legs in China?"

"That's right; they use rope."

How to get more work out of your wire rope

Get *higher-than-rated quality.*
Get *longer-than-expected service.*
Use Hercules Red-Strand. It costs no more.

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Canal . . .

Continued from page 45

dredging company, contracted with Avondale Marine Ways of Avondale, La., for rush construction of a steel barge 175-ft. long, 49½-ft. wide and 11-ft. deep for mounting the earthmoving equipment. Displacement was 853 tons.

The barge's diesel fuel tanks had a capacity of 36,000 gallons; its water tanks, 32,000 gallons. The water tanks were built under American Bureau of Shipping and United States Public Health Service standards to insure pure drinking water for the crew. The barge was designed so that, with the addition of living facilities on deck, it could be transformed into a self-contained operating unit at sea.

18 Years' Service

Mounted amidship was a tub containing the working elements of the Monighan, which has been in service 18 years. A 420-hp Fairbanks-Morse diesel engine provided power for the main shovel operation. A 240-hp Caterpillar D364 diesel powered the electrical equipment and the swing.

Motive power for the barge came indirectly from a three-drum Skagit hoist powered with a 90-hp Caterpillar diesel mounted on the deck of the barge toward the stern.

Designers provided two "spuds" on the port side of the barge to hold it firmly in position for operation of the heavy equipment. These spuds were metal posts 36 inches square and 26 feet long. Each weighed nine tons. They slipped into slots built through the barge near the port edge and extended into the ground. When lowered they penetrated the earth and held the barge in position as the equipment worked.

At moving times, the spuds were raised to a position above the bottom surface of the barge. The barge itself obtained forward propulsion by using the bucket as a pulling unit. The 90-hp diesel engine and three-drum hoist were primarly for raising and lowering the spuds. The hoist exerted a line pull of 40,000 pounds.

To handle the soft earth in the marsh land, the company designed a 12-yd. bucket of cast manganese. It was built by the Electric Steel Foundry Co. (Esco). Lewis estimated that he used the bucket to move about 80% of the dirt on the job.

For heavy digging, a 10-yd. Esco bucket was utilized. In reserve was an 8-yd. Yaun clamshell.

A flotation canal was first necessary. The berm specifications, ranging from 95 to 105 feet, made it impossible to dispose of the excavated material in the required area without utilization of the flotation canal.

Has 165-ft. Boom

The width from the outside toe of the levee to the far side of the barge canal was approximately 360 feet. The length of the Monighan's boom was 165 feet; thus, it was necessary to place the dragline somewhere on the berm between the barge canal and levee.

Because it was questionable whether the area could be matted adequately to support the 500-ton dragline, Kenyon decided to use a flotation canal and have the barge travel through the berm.

The flotation canal was dug progressively with the barge canal. The routine was to dig the flotation canal by digging ahead of the barge, drawing it forward by use of the bucket as a puller, setting the spuds and digging forward again. Whenever it was necessary to move the dragline forward, enough flotation canal was dug to place the Bucyrus-Monighan in proper digging position.

The Monighan cut the main canal alongside and filled the area beyond with the spill from the main canal to provide the specified width of the levee. The Monighan gave a peak performance on the canal job, Lewis said.

Bids for the canal work were received on June 28, 1954 by the Board of Navigation and Canal Commissioners, West Side Calhoun County Navigation District, Long Mott. Actual work began on Sept. 15, 1954, and was completed on June 12, 1955.

The canal will provide a barge terminal and outlet for transportation of bulk chemicals, particularly polyethylene, ethylene glycol and butadiene. The liquid products go from the plant, a quarter-mile distant, to a tank farm adjacent to the canal terminal. Steel barges load from the tank reserve.

Completion of the canal meant the addition of several miles of waterside facilities for additional plants and industries. The Carbide and Carbon Chemicals plant was completed in 1954 at an estimated cost of $75 million.

Engineers on the canal job were Lockwood & Andrews, Houston and Victoria, Tex. The project engineer was the firm of R. C. Pierce.

RENT INTERLOCKING STEEL SHEET PILING
'FASTER from FOSTER'
ALL LENGTHS & ALL SECTIONS TO MEET ALL YOUR JOB NEEDS
Foster's lower rental rates on all standard piling sections give you a low fixed expense as an added competitive advantage when bidding on jobs. RENT: Light-weight Corrugated Steel Sheet Piling—Pile Hammers and Extractors.
Send for: Piling Chart EE-9.
L.B. FOSTER CO.
PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
HOUSTON 2 • LOS ANGELES 5 • ATLANTA 8

Pipeline . . .

Continued from page 61

drag the pipe into the cleaned out river trench with tractors.

L. H. Gray was Associated's superintendent on their eastern contract. W. Wilson was foreman of the river crossing project. Equipment for the crossing included the custom built barge, three Caterpillar sideboom rigs, two dozers, two Bucyrus-Erie 22-Bs, one dragline and one dragshovel and a CRC bending machine. The crossing job started about June 1.

Extend Laterals

Expected completion date for the entire contract was Oct. 1. Clearance operations for loop line laying began April 15.

In addition to the loop line work of 30 and 36-in. pipe, Transcontinental Gas Pipe Line Corp. was extending its smaller diameter laterals at both ends of the Texas to New York pipe line.

Near the western end, in Louisiana and Mississippi, there were 26.97 miles of 12-in., 15.20 miles of 8-in. and 24.73 miles of 6-in. lateral line being laid. Near the northern end, in New Jersey and Pennslyvania, smaller diameter lines were also under construction. This portion included 11 miles of 24-in., 25.95 miles of 16-in. and 23.79 miles of 12-in. line.

It's an ambitious expansion program, but job contractors were going steadily ahead as the consumer demand for natural gas products continued to grow.

New Trade Literature

Subject: **A-C HD-16 Crawler**
Content: A pictorial review of the design, engineering and operating advancements of the HD-16 crawler tractor is included in an eight-page brochure. Also included are specifications and information on operator comforts and matched attachments and accessories available.
Where to get: Allis-Chalmers Mfg. Co., Tractor Group, Construction Machinery Div., Milwaukee, Wis.

Subject: **Mobile-Power Generator**
Content: A 12-page bulletin, *Electricity on Wheels*, describes General Electric's new mobile-power generator for tractors and outlines its operation and range of uses. Included in the bulletin are illustrations showing use of the generator in such applications as floodlighting, power sawing and welding. Ask for bulletin GEA-6400.
Where to get: General Electric Co., Schenectady 5, N. Y.

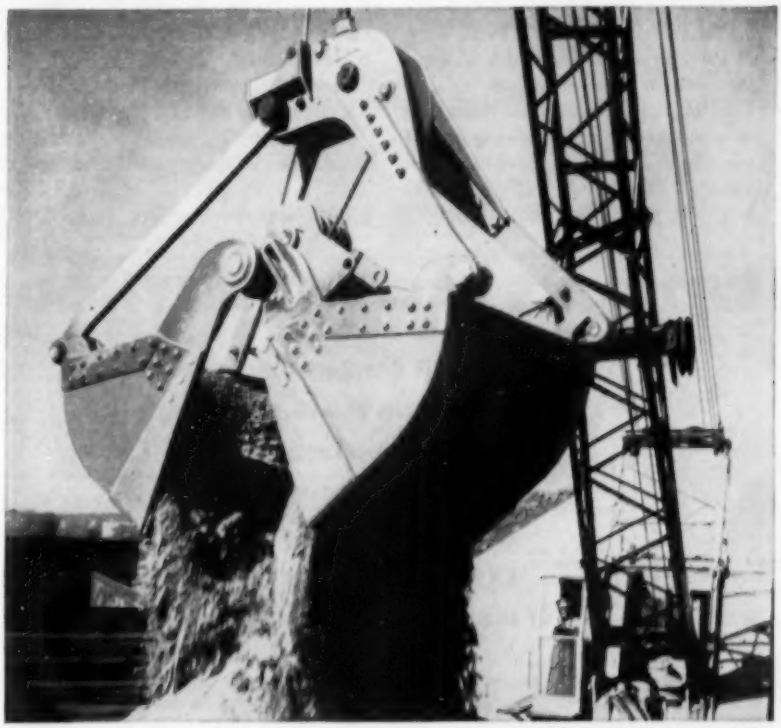
Subject: **Drainage Structures**
Content: A four-page Armco folder tells how proper drainage structures stop trouble. Typical installations are shown. Ask for folder CMS 9555.
Where to get: Armco Drainage & Metal Products, Inc., Product Information Service, Middletown, Ohio.

Subject: **Rope Bulletin**
Content: Macwhyte Company's latest *Ropeology* bulletin views such subjects as: cable-tool and rotary well drilling machines; helicopter hoisting and transporting 4,000-lb. equipment; wire rope storage; a clay mine; a dam project, and a new plastic-coated cable.
Where to get: Macwhyte Co., Kenosha, Wis.

Subject: **Air-Line Lubricators**
Content: Air-line lubricators available from Ingersoll-Rand are described in a bulletin. A large size, two-color illustration shows the construction of the unit, revealing a lack of moving

Continued on page 66

"A CARLOAD EVERY 11 MINUTES WITH OUR ERIE STRAYER BUCKET"



REPORTS DEWEY SLOOP . . . SUPERINTENDENT FORREST PLANT, HOLLIDAY SAND & GRAVEL CO.

Eleven minutes to load a 100,000-pound gondola with sand—less than an hour to fill a 215-ton hopper bucket—that's production! Just 34 seconds per bucket load!

Sand and gravel men must have this swift, efficient production to turn a fair profit. And it's this kind of production the Forrest Plant of the Holliday Sand and Gravel Co. gets day after day with their 1½ yard ERIE rehandler.

ERIE buckets are made for speed. This and the other fine ERIE features cause men like Superintendent Dewey Sloop to volunteer: "The ERIE is the best bucket we've ever had."

Check ERIE's features—then compare prices!

1. **SPEED:** Faster operation from short, powerful closing and opening action.
2. **DURABILITY:** Rigid, one-piece head shrugs off bumps and jars.
3. **LOW HEAD ROOM:** Permits higher stock piling—less frequent repositioning.
4. **LOW MAINTENANCE:** Continuous cable reeving with no reverse-S bends. Less cable to buy.

ERIE BUCKETS THE WORLD OVER

FOR CATALOGS, WRITE DEPT. E95
CABLE ADDRESS: EXIMPORT

ERIE STRAYER CO.
[illegible] GUEST ROAD - ERIE, PENNSYLVANIA

New Literature . . .

Continued from page 65

parts and a metering device. In operation, the lubricator depends on the pressure differential created by air flow through the air passage. Fixed air-line lubricators are available in quart, two-quart and 12-quart sizes. A valve-type lubricator also is available for use with manifold installations on tunnel jumbos, to take care of a number of units from one main oil supply tank. A table on the back cover of the bulletin was designed to help the user select the proper size lubricator for his machine or units. The physical and chemical requirements of the rock drill lubricants also are shown in the bulletin. Ask for form 4169.

Where to get: Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.

Subject: **Aircomatic Welding Equipment**

Content: Aircomatic welding equipment is described in a 16-page catalog. Aircomatic is the Air Reduction Company's inert-gas-shielded metal arc welding process. Included in the illustrated booklet are manual and automatic units, accessory apparatus and welding wire.

Where to get: Air Reduction Sales Co., 60 E. 42nd st., New York 17, N. Y.

Subject: **Diesel Electric Sets**

Content: The line of small size, high capacity Caterpillar diesel electric generator sets is described in *Modern Electric Power*, an illustrated four-page booklet. Ask for form 31649.

Where to get: Caterpillar Tractor Co., Peoria, Ill.

Subject: **Euclid TC-12 Crawler**

Content: Euclid's TC-12 crawler tractor, which is powered by two 194-hp diesels, is described and illustrated in a four-page catalog. Ask for form No. 601.

Where to get: Sales Promotion Dept., Euclid Div., General Motors Corp., Cleveland 17, Ohio.

Subject: **P & H Hoists**

Content: Bulletins H-37, H-38 and H-39, all containing four pages, describe principal engineering features and list condensed specifications of several hoists in the P & H line. H-37 describes the Hevi-Lift special electric hoist, a heavy-duty unit for use in the medium-lifting range; H-38 describes the Zip-Lift special electric hoist, a rope-control, wire-rope unit, and H-39 describes the Zip-Lift electric hoist.

Where to get: P & H Hoist Div., Harnischfeger Corp., Milwaukee 46, Wis.

Subject: **Concrete Forms**

Content: A four-page brochure shows the principal uses, features and new applications of Atlas Compo forms for concrete construction.

Where to get: Irvington Form & Tank Corp., Dept. CFB, 20 Vesey st., New York, N. Y.

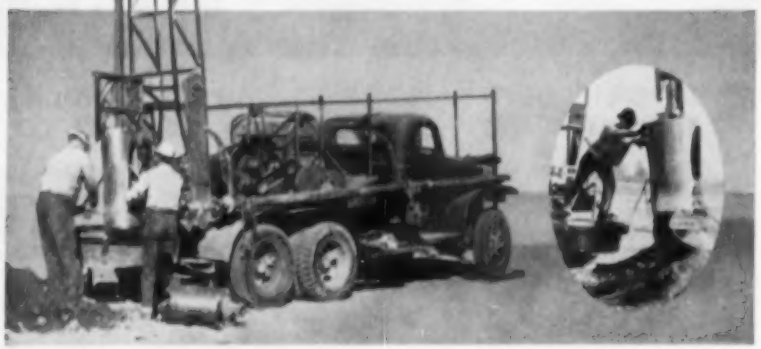
Subject: **195-hp Grader**

Content: Huber-Warco's new 195-hp. motor grader, the 5D-190, is the subject of a 12-page bulletin. Action photographs are included of the machine which was designed to handle heavy-duty grading jobs in construction, mining, coal and logging. Ask for bulletin HWG-508. Another 12-page bulletin describes Huber-Warco's Maintainer, the Model M-52. Included are color action photographs of the machine. Ask for bulletin HWM-512.

Where to get: Huber-Warco Co., Marion, Ohio.

WORLD'S FASTEST METHOD

DIGGING CAISSON PIER HOLES
PREPARING BELLED FOOTINGS
PRE-BORING CONCRETE PILES
DRILLING WATER WELLS
DIGGING CESSPOOLS
EXPLORING MINERAL DEPOSITS
TESTING SOIL CONDITIONS



DRILLS 84" DIAM. HOLES 200' DEEP

A TWO MAN CREW, using the Calweld Model 150-A Earth Drill can complete as much as 250 feet of 36- to 48-inch diameter hole in an 8-hour shift. Equipped with specially designed interchangeable buckets, earth drilling operations can be stepped up through every type of subsurface formation. Calweld Model 150-A drills holes as deep as 200 feet and in any diameter ranging from 16 to 84 inches. Entire unit is built on skid frames to allow convenient mounting on any two-ton or larger truck. Rig can be easily moved and set up to quickly complete multiple bores with a minimum of lost drilling time. You get more hole faster with Calweld Earth Drills. Get all the facts; write today for complete information.

CALIFORNIA WELDING & BLACKSMITH SHOP, INC.
7222 EAST SLAUSON AVE., LOS ANGELES 22, CALIF.

CALWELD BUCKET TYPE **EARTH DRILLS**

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

Bucyrus-Erie 120-B shovel serial no. 37106 with two 5 yard dippers and spare long handle with 4 yard dipper; also includes about 2,000 feet power cable and a considerable quantity repair parts; good working condition; location State of Washington; price: $87,500. L. E. Dixon Company, 409 South California, San Gabriel, California.

Two Marion 480 electric shovels for power supply three phase 60 cycle 2300 volts located in the South, fair operating condition, also large inventory of unused spare parts, reasonable. For further information, contact: Box 3666

Bucyrus-Erie model 150-B Ward Leonard electric shovel, pushbutton starting, separately driven exciter, Tri-Ten dipper handle, available with six cubic yard rock dipper or special seven cubic yard dipper; serial no. 101329; shipped August 1953; excellent condition; location: South Dakota. Box 3598

Two model 4500 Manitowoc draglines equipped with 120 ft. boom and 6 yard Hendrix dragline bucket.

One model 6 Northwest shovel with 3 yard coal loading bucket; this equipment is in first class condition and can be inspected at Hanna, Wyoming. Nugget Coal & Timber Co., Midland Savings Building, Denver, Colorado, Phone: Tabor 5-0986.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Bucyrus-Erie 10-B shovel #73197, GM engine model 43301 #4C-2208; built up cone rollers; inst. new bushings in house; new 1⅛" oversize pins in track, new shafts, bearing in track sprockets, new swing pinion, and inst. miscellaneous parts where needed; tuned engine, changed fuel elements and steam cleaned shovel; painted and installed decals, price: $5950.

Bucyrus-Erie 10-B shovel #19345, GM engine model 43400 #4C-047; replaced bottom of revolving deck, sleeve and bracket, cone rollers and washers; replaced pins in track oversize 1¼", ring gear and pinion gear of travel, oil seal and holder in gear case; clutches in travel and swing; replaced all steering gears and shaft, bearing on hoist shaft, drum on boom hoist, bearings on center shaft thru deck, new steering clutches, disc and springs, cam rollers in steering; replaced three new teeth in bucket, dipper trip cable, leaking gaskets on motor; tuned up motor; motor overhauled 30 days ago, steam cleaned and painted and installed decals, Price: $4950.

Thirty foot lattice type crane boom with lagging and fair leads, price: $500.

Bucyrus-Erie 54-B Cat frames: one BC-41 right hand Cat frame, one BC-42 left hand Cat frame; removed from 54-B, serial no. 33223. These frames are practically new, in excellent condition, and were removed because the contractor installed long Cat frames for crane use; factory selling price $2525 each—our price: $2500 for the pair f.o.b. Richmond.
Bemiss Equipment Corporation, 2219 Chamberlayne Avenue, Richmond 22, Virginia.

Koehring crane model 301 ¾ yard with 45' boom International diesel engine fairleads, good condition, a real bargain at $4,750.

Owen rock grapple model 51-RA handles 1 to 4 tons, good condition will rent for $225 a month or sell for $1,450. The Bucket Mart, Inc., 3400 S. Federal Hwy., Ft. Lauderdale, Florida.

Buckeye "Clipper" ¾ cu. yd. shovel, backhoe, crane, and clamshell attachments including Rudomatic tagline, 40 feet of boom; Caterpillar model D-4600 diesel motor, air controls; machine very clean and in very good shape; serial no. 70-2827 sale price: $11,500 f.o.b. Md. Stuart M. Christhilf & Co., Inc., 134-136 West Mt. Royal Avenue, Baltimore 1, Md.

Lorain model L-820, 2 yd. shovel, serial no. 18895 with Waukesha model WAK-6 diesel engine; completely rebuilt, no expense has been spared to put this machine in "like-new" condition; see it and check the list of new parts installed by us; you'll agree it is well worth the price of $35,000. H. O. Penn Machinery Co., Inc., 140th Street and East River, New York 54, New York.

MISCELLANEOUS EQUIPMENT

Model 15-B Bucyrus-Erie ½ yard crane-dragline combination, long frames, wide crawlers, diesel power; very good condition; price at job site: $10,950.

Model J Quickway shovel-hoe combination, truck mounted, very good condition, f.o.b job site: $3,000.

Model 255 P & H ¾ yard dragshovel, diesel power, excellent condition, priced right.

Bucyrus-Erie H-2 Hydrocrane, mounted on Chevrolet truck, price reduced for quick sale: $2,450.

⅜ yard Blaw Knox clamshell bucket, very good condition, $500.

⅜ yard Erie Strayer clamshell bucket, very good condition, $450. Subject to prior sale, terms: trade. Call or write: J. P. Waite Construction Co., 3308 West Pierce St., Milwaukee, Wisconsin, Phone: EVergreen 4-1900.

New 18" dredging pump, rectangular cross section casing, high alloy steel liners, high alloy cast steel 4 vane runner; spare liners.
Box 3587

Bucyrus-Erie 22-T blast hole drill; purchased new 1952; 34 ft. 6 in. one-piece derrick; gasoline engine driven with electric starter; 22-W bull reel; perfect condition.
Loomis Clipper #44, crawler mounted, gasoline engine driven; both machines immediately available. Kermit Snyder, Deer Lake, Pine Blvd., Orwigsburg, Pa., Phone: Orwigsburg 6-8221.

22-B Bucyrus-Erie shovel front with rock dipper, originally sold on machine no. 82999, price: $2,000.

⅜ yd. Bucyrus-Erie single crowd shovel front, 10-B, price: $400.

¾ yd. Bucyrus-Erie twin crowd shovel front, 10-B, price: $500.

34-E Ransome dual drum paver with Waukesha gasoline engine, in serviceable condition, serial #12141, price: $2,500. E. F. Craven Company, P. O. Box 538, Greensboro, N.C., Phone: 3-5521.

Six cubic yard dipper and Tri-Ten handle for Bucyrus-Erie 150-B Shovel; slightly used but in excellent condition. Box 3588

Bucyrus-Erie 20-B all electric tunnel shovel; Bucyrus 2½ shovel front att., locomotive 7 ton narrow gage; Bucyrus-Erie 10-B no attachment. Harry Douglas, 2905 N. 17th St., Milwaukee, Wis.

The following equipment has been declared surplus and is available for immediate sale:

2 16" MC fig. 6977 Single Impeller "A" Turbine pumps Cp. w/65' Setting of 12"x1⅞" Column & Shaft w/20x12 Surface Discharge Heads Less Prelube Tank and Fittings w/12" Basket Strainers, w/60 H.P. 1750 RPM 3 Phase 60 Cycle, 440 Volts V.H.S. Motors w/N.R.R. complete with Magnetic Reduced Voltage Controls for 440 Volts. Located—Durham Storage.

1 24" MC Fig. 6977 Single Stage Impeller "A" Turbine Pump w/65' Setting 16"x2⅞" Column and Shaft w/20x12 Surface Discharge Head Less Prelube Tank and Fittings w/16" Basket Strainer w/150 H.P. 1160 RPM 3 Phase 60 Cycle 440 Volts VHS Motor w/NRP w/1 Magnetic Reduced Voltage Starter for 150 H.P. 3 Phase 60 Cycle 440 Volt Motor. Located—Durham Storage.

1 32" MC Fig. 6977 6 Stage Impeller "A" Turbine Pump cp. w/65' Setting of 18"x2⅞" Column and Shaft w/30 ½"x12" Surface Discharge Head Less Prelube Tank and Fittings w/18" Basket Strainer w/200 H.P. 860 RPM 3 Phase 60 Cycle 440 volt VHS Motor w/NRR and 1 magnetic Reduced Voltage Starter for 200 H.P. 3 Phase 60 Cycle 440 Volt Motor. Located—Durham Storage.

1 Cedarapids Model 60 Compactor, complete with standard Hitch powered by International Model U-164 gasoline engine. Serial No. 15925. Located—Sinnamohoning, Pa.

1 Model LA-88 (New) P & H Single Pass Stabilizer equipped with General Motors Series 71, Twin 6, Diesel Motor, Model 12101. Located—Durham Storage.

1 Euclid Model 7BV Loader complete with 24" offset hitch, with GM Diesel Engine. Serial No. 105. Engine No. 63-6A-5650. Located—Maryland Storage.

1 Athey Model 3 Force-Feed Loader. Serial No. 03-L-1198. Located—Durham Storage. Write, wire or call Central Eng. & Contracting Corp., Mr. J. Ray Rex, Durham, N.C.

LeRoi 210 HP, 4 cyl., 7" stroke gasoline engine complete with 12 V. starter; run approx. 100 hrs. Refrigeration Engr. Co., Montgomery, Minn., Phone: 213.

BUSINESS FOR SALE

Business for sale: Construction-Excavating, established eighteen years, Montana; grossing about $100,000 annually at high net profit; equipment in tip-top condition; sand and gravel pit go with business; health forces sale; your opportunity to buy a real money maker. C-5066 Continental Business Buyers & Associates, 804 Grand Avenue, Kansas City, Missouri.

POSITION WANTED

Superintendent available. 30 years experience and qualifications covering hi-ways, airports, large sewers, water lines, heavy and light excavating; all types; know cost and modern equipment; sober, honest, and reliable; middle West or West. Box 3593

HELP WANTED

Wanted: Contractor with portable hydraulic dredge to move 1,500,000 c.y. location: Northern Illinois area. Box 3673

Notes from the Manufacturers

Allis-Chalmers Mfg. Co., Inc., has appointed Robert S. Reaves as assistant to the vice president, director of engineering, Tractor Group. Reaves succeeds Harold W. Schudt, now president of Canadian Allis-Chalmers, Ltd., an Allis-Chalmers subsidiary. Reaves joined the company in Oct. 1935.

Aveling-Barford, Ltd., Grantham, England, has formed a new subsidiary, Aveling-Barford (Pty), Ltd., which was to have begun operations in July from the head office in Johannesburg, South Africa. Branch offices will be maintained in Cape Town and Durban and at Salisbury, Southern Rhodesia. The entire range of Aveling-Barford road rollers, dumpers, graders and building plant and the Aveling-Austin 99-H motor grader will be distributed and serviced by the new company throughout the Union of South Africa and parts of the Rhodesia-Nyasaland Federation. Aveling-Barford has purchased a controlling interest in the engineering firm, Messers. E. W. Gray (Pty) Ltd., Steeledale, Johannesburg, on whose premises the new company's head office is located.

Caterpillar Tractor Co., Peoria, Ill., devotes six times more space today to parts operations than it did in 1940, dealers who attended the company's recent exposition were told. Caterpillar stocks 65,000 parts at both the Joliet (Ill.) and Peoria parts departments and 42,000 at the York (Pa.) parts department. The company's parts departments employ 2,950 persons, as compared to 543 in 1940. The dealers were told that Cat parts could be purchased with as many as four different currencies. Caterpillar has subsidiaries in England, Brazil and Australia. The dealers visited Caterpillar's new motor grader and wheel tractor plant at Decatur, Ill. During the visit, the first unit, a Cat No. 12 motor grader, came off the assembly line.

Colorado Fuel and Iron Corp., Wickwire Spencer Steel Div., has announced that Cal-Tie Wire is now being manufactured at its Buffalo (N.Y.) plant and will be marketed extensively throughout the eastern United States. Cal-Tie wire previously had been available only in the West and in limited quantity in the East.

Cooper-Bessemer Corp., Mount Vernon, Ohio, has assigned C. M. Reagle as district manager of its New York domestic territory. Reagle currently is a vice president and director of Cooper-Bessemer and is manager of the firm's marine sales. Reagle joined the original Bessemer Gas Engine Co. in 1922. He was elected vice president in 1929 when the Bessemer Gas Engine Co. merged with the Cooper Co. to form the Cooper-Bessemer Corp.

Four Wheel Drive Auto Co., Clintonville, Wis., has received a $5,353,000 order from the United States Army Corps of Engineers to manufacture 335 crane carriers. The vehicles will have six-wheel drive and will be equipped with 20-ton cranes.

Hercules Steel Products Corp. and Central Ohio Steel Products Co., both of Galion, Ohio, have been given approval by stockholders to merge. The merger was to have been effective Aug. 31. The new company, Hercules Galion Products, Inc., will have a working capital of approximately $4 million. David Van Alstyne, Jr., formerly Hercules board chairman, will be chairman of the new company. E. Paul Monroe, Hercules Steel Products president, will be president of the company, and Oliver C. Henkel, Central Ohio president, will be senior vice president.

Frank G. Hough Co., Libertyville, Ill., has appointed Robert J. Sudlow as district representative for the New England states. The MW Construction Equipment division of Metalweld, Inc., Philadelphia, Pa., has been appointed an exclusive distributor for Hough's Payloader, wheel tractor shovels and industrial tractors. Metalweld will handle sales and service in eastern Pennsylvania, southern New Jersey and New Castle, Del.

Mack Trucks, Inc., New York, N.Y., recently shipped 30 Mack Model B-42X trucks to South America, where they will be used by the Ministry of Public Works of the Department of Cali, Colombia.

Nordberg Mfg. Co., Milwaukee, Wis., has appointed two distributors for its Power Chief diesel and gas engines. They are Tractor & Equipment Co., 201 N. Central st., Sidney, Mont., and Lively Equipment Co., 2601 Fourth st., N. W., Albuquerque, N.M., and its affiliate, Lively Equipment Co., El Paso, Tex. Tractor & Equipment's territory is the eastern third of Montana and the western quarter of North Dakota. The firm has branch stores in Glasgow and Miles City, Mont. Lively Equipment's territory is New Mexico, the El Paso area and northeastern Arizona.

Pioneer Engineering Works, Inc., Minneapolis, Minn., has appointed Neff Machinery, Inc., Miami, Fla., as a distributor in southern Florida for the Continuflo line of mineral and aggregate processing equipment and bituminous mixing plants. Neff will serve that part of Florida south of and including the counties of Charlotte, Glades, Okeechobee and Indian River.

Timken Roller Bearing Co., Canton, Ohio, has appropriated $850,000 for further expansion of production facilities at its Bucyrus (Ohio) plant. The appropriation brings to more than $10 million the amount expended for expansion of the Bucyrus plant.

STANDS UP TO SEVERE USE

and even abuse

One word describes a Hayward — *ruggedness*. Yes, it's as tough, strong, sturdy as a bucket can be — and even more so. Extreme simplicity, little if any upkeep, high operating efficiency! Details on request. Write! THE HAYWARD COMPANY, 50 Church St., New York 7, N.Y.

HAYWARD BUCKETS

GLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES

famous for performance since 1888

(PLEASE GIVE THIS ADVERTISEMENT TO YOUR BLASTING FOREMAN)

To connect a Branch Line with the Trunk Line

Use this HALF HITCH for Plain and Reinforced Primacord. Draw it up as tight as you can, and be sure the Branch Line leads off at a RIGHT ANGLE to the Trunk Line.

Stray ELECTRICAL CURRENTS DON'T DETONATE PRIMACORD

Unwanted electrical energy is on the increase. The sources are several: a bolt of lightning several miles away, static, radio transmitters, galvanic action, transmission lines, power cables to electrically operated equipment . . . Under certain conditions any of these sources could set off a blast prematurely.

Not so when the holes are primed and hooked up with Primacord. For Primacord is the *insensitive* detonating agent. It cannot be set off by sparks, friction, ordinary shock, stray currents — and *even a direct hit by lightning failed to detonate it!*

Only when the blasting cap is attached at the firing end of the Primacord trunk line is the blast ready to go. And, of course, you do this only when everything's all set.

For more information see your Explosives Supplier, or write to

THE ENSIGN-BICKFORD COMPANY • SIMSBURY, CONNECTICUT

Primacord — Quarrycord — Ignitacord® — Safety Fuse Blasting Accessories — Established 1836

To connect a Branch Line of Plastic Reinforced or Plastic Wire Countered Primacord with the Trunk Line

use this DOUBLE HITCH in the textile-covered Primacord Trunk Line. *Draw it up as tight as you can, and make sure that the Branch Line leads off at a RIGHT ANGLE to the Trunk Line.*

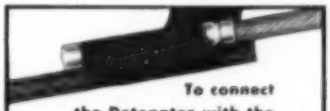
PRIMACORD®

DETONATING FUSE

PROVED AND APPROVED

To lengthen a Trunk Line

of Plain or Reinforced Primacord, tie a SQUARE KNOT. *Draw it up as tight as you can — it won't slip back. Caution: don't use any knot in a hole — it might break or hang up explosives when loading.*



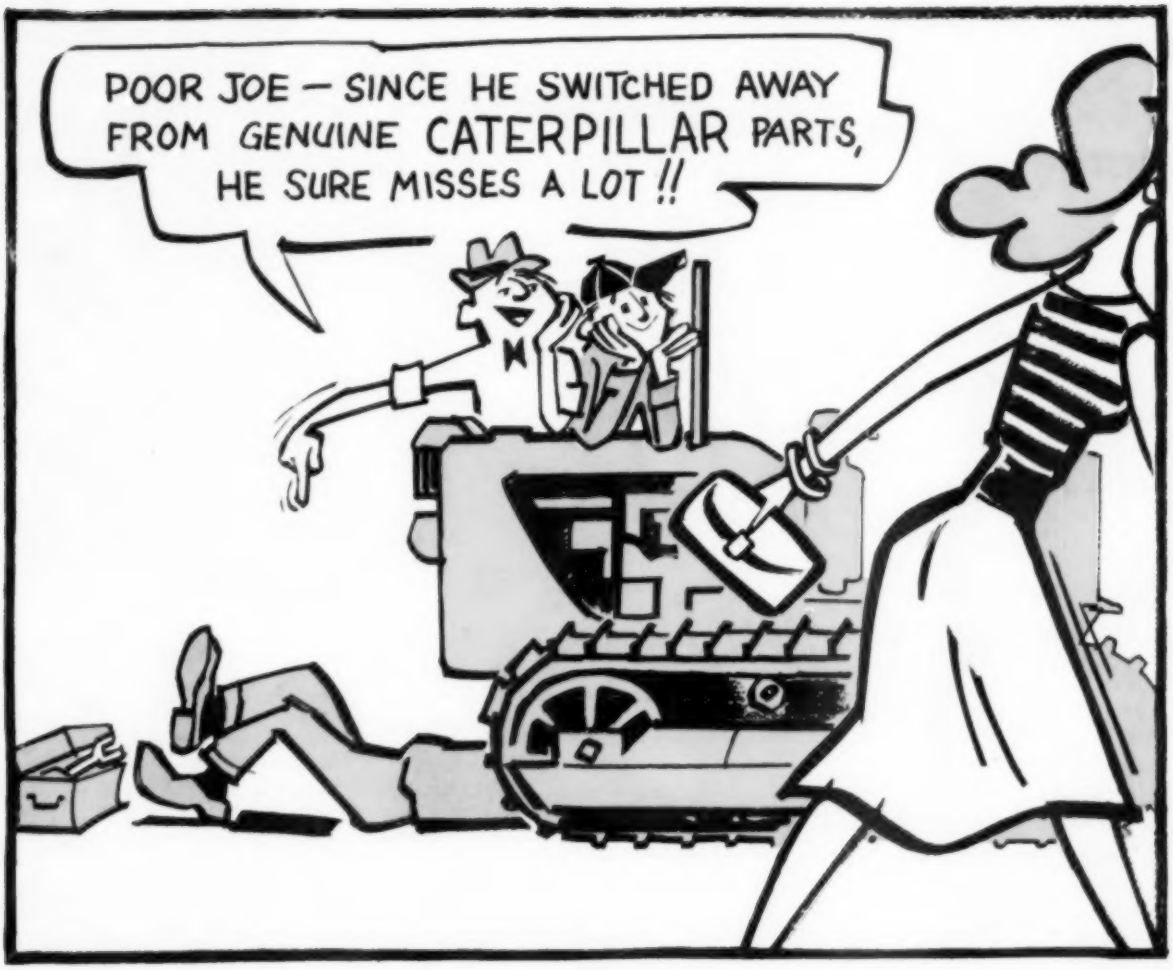
To connect the Detonator with the Primacord Trunk Line

use FRICTION TAPE. You can detonate Primacord with fuse and cap or electric blasting cap. Lay the cap alongside of the Primacord with the business end of the cap pointing in the direction that the Primacord will detonate. Tape the two snugly together, so that you have a tight connection.

Cut the Primacord off the Spool Immediately

Make this a safety habit! As soon as you have taken off the length of Primacord you need for a down-hole or for a trunk-line, cut it off the spool! Don't waste a second — do it now!

P-19



Down time is no joke. Say it happens when a clutch facing or a brake lining wears out.

If you replace with a Caterpillar-built part, here's what you're sure of: a friction part that's made of a material with high torque capacity but low friction loss, a long-wearing material that *really* resists glazing and chipping, a tough material that's been through rugged tests in the laboratory, on the proving ground, and out on actual jobs. In short, you're sure of *less* down time in the future.

If you replace with a substitute part—can you be sure of anything?

Better get genuine Caterpillar parts every time.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

These are genuine CAT* brake linings. They're made of a specially designed molded asbestos material. You can't buy better anywhere.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.